FENOC™

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December 16, 2015
L-15-355

Confirmatory Order EA-14-094

ATTN: Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT:
Davis-Besse Nuclear Power Station, Unit No. 1
Docket No. 50-346, License No. NPF-3
Application for License Amendment to Adopt NFPA Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition)"

The *Code of Federal Regulations*, Title 10, Part 50.48(c) (10 CFR 50.48(c)), allows a licensee to maintain a fire protection program that complies with National Fire Protection Association Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition" (NFPA 805), as an alternative to compliance with existing fire protection program requirements. 10 CFR 50.48(c) further requires the licensee to submit a request to comply with NFPA 805 in the form of an application for license amendment.

By letter dated April 1, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14091A453), FirstEnergy Nuclear Operating Company (FENOC) established a formal regulatory commitment to submit an application for license amendment to implement 10 CFR 50.48(c) at Davis-Besse Nuclear Power Station, Unit No. 1, (DBNPS) on or before December 31, 2015. By letter dated June 30, 2014 (ADAMS Accession No. ML14164A151) the Nuclear Regulatory Commission (NRC) issued Confirmatory Order EA-14-094, modifying License No. NPF-3 for DBNPS as follows:

A. FENOC will submit an acceptable license amendment request for Davis-Besse Nuclear Power Station, Unit No. 1, to adopt NFPA Standard 805 by no later than December 31, 2015.

B. FENOC will continue to receive enforcement discretion until December 31, 2015. If the NRC finds that the license amendment request is not acceptable, the NRC will take steps consistent with the Enforcement Policy.

Pursuant to the Confirmatory Order, and in accordance with the *Code of Federal Regulations*, Title 10, Part 50.90, "Application for amendment of license, construction permit, or early site permit," FENOC hereby requests amendment of the DBNPS facility operating license granting the approval of a performance-based, risk-informed fire protection program consistent with 10 CFR 50.48(c) and NFPA 805.

FENOC is implementing the methodology described in Nuclear Energy Institute (NEI) 04-02, Revision 2, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)" to transition DBNPS from the current fire protection licensing basis to the new requirements as outlined in NFPA 805. The NRC issued Regulatory Guide 1.205, Revision 1, "Risk-Informed, Performance-Based Fire Protection for Existing Light Water Nuclear Power Plants" (RG 1.205), endorsing NEI 04-02, with exceptions, in December 2009.

The enclosure to this letter, "FirstEnergy Nuclear Operating Company Davis-Besse Nuclear Power Station Unit 1, Transition to 10 CFR 50.48(c) - NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition," hereafter referred to as the Transition Report, describes the transition methodology utilized and documents how FENOC complies with the new requirements for DBNPS. This Transition Report provides information:

- Required by 10 CFR 50.48(c).
- Recommended by NEI 04-02 and appropriate Frequently Asked Questions.
- Recommended by RG 1.205, Revision 1.

The Transition Report is provided in a format consistent with a template developed by the industry with the support of NEI, and includes the technical and regulatory justifications required to support this application.

FENOC is fully committed to the improvement of fire protection programs through voluntary implementation of 10 CFR 50.48(c) at DBNPS. Until such time that the proposed license amendment is approved and implemented, FENOC will continue to maintain fire safety at DBNPS in accordance with the facility operating license.

Plant modifications are required as part of the proposed license conditions. FENOC proposes that the plant modifications listed in Table S-1 of the enclosure be completed by the startup of the first refueling outage following the issuance of the license amendment.

Furthermore, specific activities are required for implementation of the license amendment. FENOC requests a period of 180 days following the issuance of the license amendment to fully implement the new NFPA 805 fire protection program that includes procedure changes, process updates, and training to affected plant personnel. Table S-2 of the enclosure contains a list of those implementation items. Additional allowance is requested to allow implementation no later than 60 days after startup if the suggested 180-day period ends during a scheduled refueling outage.

There are no regulatory commitments contained in this submittal. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager - Fleet Licensing, at 330-315-6810.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 16, 2015.

Sincerely,

Brian D. Boles

Brian D. Boles

Enclosure:
"FirstEnergy Nuclear Operating Company Davis-Besse Nuclear Power Station Unit 1, Transition to 10 CFR 50.48(c) – NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants, 2001 Edition"

cc: Director - NRC Office of Enforcement (without Enclosure)
NRC Regional Administrator - Region III (without Enclosure)
NRC Resident Inspector (without Enclosure)
NRC Project Manager (without Enclosure)
Executive Director, Ohio Emergency Management Agency, State of Ohio (NRC Liaison) (without Enclosure)
Utility Radiological Safety Board (without Enclosure)

Enclosure
L-15-355

FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
Unit 1

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

FirstEnergy

Transition Report

(1751 pages follow)

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Executive Summary

FirstEnergy Nuclear Operating Company (FENOC) will transition the Davis-Besse Nuclear Power Station, Unit 1, (DBNPS) fire protection program to a new Risk-Informed, Performance-Based (RI-PB) alternative per 10 CFR 50.48(c) which incorporates by reference NFPA 805. The licensing basis per 10 CFR 50.48(b), 10 CFR 50, Appendix R, General Design Criteria (GDC) 3 Fire Protection, and BTP CMEB 9.5-1 (NUREG-0800, July 1981) will be superseded.

FENOC submitted a Letter of Intent to the Nuclear Regulatory Commission (NRC) dated December 22, 2005, to transition to NFPA 805. The NRC granted an extension of a three-year enforcement discretion period to correspond to a license amendment request (LAR) submittal date of July 1, 2014. In a letter dated April 1, 2014, FENOC communicated a request to extend the LAR submittal date to December 31, 2015 in accordance with SECY-12-0031. On June 30, 2015, the NRC issued a confirmatory order that revised the NFPA 805 LAR submittal date and extended the enforcement discretion date to December 31, 2015.

The transition process consisted of a review and update of DBNPS documentation, including the development of a Fire Probabilistic Risk Assessment (PRA) using NUREG/CR 6850 as guidance. This Transition Report summarizes the transition process and results. This Transition Report contains information:

- Required by Title 10, Code of Federal Regulations (CFR) 50.48(c).
- Recommended by guidance document Nuclear Energy Institute (NEI) 04-02, Revision 2, and appropriate Frequently Asked Questions (FAQs).
- Recommended by guidance document Regulatory Guide (RG) 1.205, Revision 1.

Section 4 of the Transition Report provides a summary of compliance with the following NFPA 805 requirements:

- Fundamental Fire Protection Program Elements and Minimum Design Requirements.
- Nuclear Safety Performance Criteria, including:
  - Non-Power Operational Modes.
  - Fire Risk Evaluations.
- Radioactive Release Performance Criteria.
- Monitoring Program.
- Program Documentation, Configuration Control, and Quality Assurance.

Section 5 of the Transition Report provides regulatory evaluations and associated attachments, including:

- Changes to the License Condition.
- Changes to the Technical Specifications, Orders, and Exemptions.

- Determination of No Significant Hazards and Evaluation of Environmental Considerations.

The attachments to the Transition Report include sufficient detail to support the transition process and results.

Attachment H contains the approved FAQs not yet incorporated into the endorsed revision of NEI 04-02. These FAQs have been used to clarify the guidance in RG 1.205, NEI 04-02, and the requirements of NFPA 805 and in the preparation of this LAR.

Acronym List

1E-7	$1.0x10^{-7}$
1E-8	$1.0x10^{-8}$
AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
ADS	Automatic Depressurization System
AFP	Auxiliary Feedwater Pump
AFPT	Auxiliary Feedwater Pump Turbine
AFW	Auxiliary Feedwater
AHJ	Authority Having Jurisdiction
AMPS	Amperes
ANO	Arkansas Nuclear One
ANS	American Nuclear Society
APCSB	Auxiliary & Power Conversion Systems Branch
API	American Petroleum Institute
ASEP	Accident Sequence Evaluation Program
ASME	American Society of Mechanical Engineers
ASP	Auxiliary Shutdown Panel
ASSCKT	Associated Circuit
ASTM	American Society for Testing and Materials
ATWS	Anticipated Transient Without Scram
AUX	Auxiliary
AVV	Atmospheric Vent Valves
BE	Basic Event
BLDG	Building
BTP	Branch Technical Position
BVNPS	Beaver Valley Nuclear Power Station
BWR	Boiling Water Reactor
BWROG	Boiling Water Reactor Owners Group
BWST	Borated Water Storage Tank
CAC	Containment Air Cooling
CACS	Containment Air Cooling System
CAFTA	Computer Aided Fault Tree Analysis System
CAR	Compliance Assessment Report
CBDT	Cause-based Decision Tree
CC	Capability Category
CCDP	Conditional Core Damage Probability
CCF	Common-Cause Failure
CCW	Component Cooling Water
CCWS	Component Cooling Water System
CDF	Core Damage Frequency
CF	Circuit Failures
CFAST	Consolidated Model of Fire and Smoke Transport
CFR	Code of Federal Regulations
CFT	Core Flood Tanks
CI	Containment Isolation

CLB	Current (Pre-Transition) Licensing Basis
CLG	Cooling
CMEB	Chemical Engineering Branch
CMU	Concrete Masonry Unit
CR	Condition Report
CRD	Control Rod Drive
CREVS	Control Room Emergency Ventilation System
CS	Cable Selection
CSR	Cable Spreading Room
CST	Condensate Storage Tanks
CT	Current Transformer
CTMT	Containment
CTRM	Control Room
CWMT	Clean Liquid Waste Monitoring Tank
CWRT	Clean Water Receiver Tank
DAFW	Dedicated Auxiliary Feedwater
DB	Davis-Besse Nuclear Power Station
DBA	Design Basis Accident
DBD	Design Basis Document
DBNPS	Davis-Besse Nuclear Power Station
DC	Direct Current
DCA	Design Certification Application
DECON	Decontamination
DEG	Degree
DFM	Detailed Fire Modeling
DFMWB	Detailed Fire Modeling Workbook
DFP	Diesel Fire Pump
DH	Decay Heat
DHR	Decay Heat Removal
DHRS	Decay Heat Removal System
DID	Defense-in-Depth
DISCH	Discharge
DOST	Diesel Oil Storage Tank
ECCS	Emergency Core Cooling System
ECF	Early-Containment Failure
EDG	Emergency Diesel Generator
EEEE	Existing Engineering Equivalency Evaluation
ELEV	Elevation
EMERG	Emergency
EMRV	Electro-Mechanical Relief Valve
EOP	Emergency Operating Procedure
EPM	Engineering Planning & Management, Inc.
EPRI	Electric Power Research Institute
ERFBS	Electrical Raceway Fire Barrier Systems
ERO	Emergency Response Organization
ESSPWR	Essential Electrical Distribution System

ET	Event Tree
EWD	Elementary Wiring Diagram
F&O	Facts and Observations
FAOR	Fire Area Optimization Report
FAQ	Frequently Asked Question
FDS	Fire Dynamic Simulation
FENOC	FirstEnergy Nuclear Operating Company
FHA	Fire Hazard Analysis
FHAR	Fire Hazard Analysis Report
FIVE	Fire-Induced Vulnerability Evaluation
FLASH-CAT	Correlation for Flame Spread over Horizontal Cable Trays
FLEX	Diverse and Flexible Coping Strategies
FM	Factory Mutual
FMEA	Failure Mode and Effects Analysis
FMFWTRIP	Main Feedwater Trip
FMWB	Fire Modeling Workbook
FP	Feed Pump
FP	Fire Protection
FPP	Fire Protection Program
FPRA	Fire Probabilistic Risk Assessment
FR	Federal Register
FRE	Fire Risk Evaluation
FSAR	Final Safety Analysis Report
FTR	Failure to Run
FTS	Failure to Start
GDC	General Design Criterion
GE	General Electric
GE	General Emergency
GL	Generic Letter
GPAB	Global Plant Analysis Boundary
H2	Hydrogen
H2O	Water
HBBD	Bus A Breaker to Transformer XBD
HCR	Human Cognitive Reliability
HDE	High Density Elastomer
HEAF	High Energy Arc Fault
HEP	Human Error Probability
HEPA	High-Efficiency Particulate Absorption
HFE	Human Failure Event
HGL	Hot Gas Layer
HPI	High Pressure Injection
HPIS	High Pressure Injection System
HPSI	High Pressure Safety Injection
HRA	Human Reliability Analysis
HRE	High Risk Evolution
HRR	Heat Release Rate

HSS	High Safety Significant
HTR	Heater
HVAC	Heating, Ventilation, and Air Conditioning
HVSGR	High Voltage Switchgear
I&C	Instrument and Control
IE	Initiating Event
IEEE	Institute of Electrical & Electronics Engineers
INEL	Idaho National Engineering Laboratory
INPO	Institute of Nuclear Power Operations
INSTR	Instrumentation
ISGTR	Induced Steam Generator Tube Ruptures
ISLOCA	Intersystem Loss of Coolant Accident
K	Kerrite
Keff	K(effective)
KSF	Key Safety Functions
LA	Licensing Action
LAR	License Amendment Request
JB	Junction Box
LCO	Limiting Condition for Operation
LE	LERF Analysis
LER	Large Early Release
LERF	Large Early Release Frequency
LLOCA	Large Break Loss of Coolant Accident
LLRWSF	Low-Level Rad-Waste Storage Facility
LOCA	Loss of Coolant Accident
LOFW	Loss of Feedwater
LOOP	Loss of Offsite Power
LPCI	Low-Pressure Coolant Injection System
LPI	Low Pressure Injection
LSS	Low Safety Significant
LVL	Level
LVSGR	Level Steam Generator
MAAP	Modular Accident Analysis Program
MCA	Multi-Compartment Analysis
MCC	Motor Control Center
MCR	Main Control Room
MDFP	Motor-Driven Feed Pump
MDPP	Motor-Driven Auxiliary Feedwater Pump
MGL	Multiple Greek Letter
MH	Manhole
MISC	Miscellaneous
MLOCA	Medium Break Loss of Coolant Accident
MOV	Motor Operated Valve
MPR	Mechanical Penetration Room
MQH	Method of McCaffrey, Quintiere, and Harkleroad
MR	Maintenance Rule

MS	Main Steam
MSIV	Main Steam Isolation Valve
MSO	Multiple Spurious Operation
MSPI	Mitigating Systems Performance Indicator
MSSV	Main Steam Safety Valves
MTC	Maintenance
MU	Makeup
MUP	Makeup Pump
MUT	Makeup Tank
N2	Nitrogen
NEI	Nuclear Energy Institute
NEIL	Nuclear Electric Insurance Limited
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
NPO	Non-Power Operation
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
NSCA	Nuclear Safety Capability Assessment
NSEL	Nuclear Safety Equipment List
NSPC	Nuclear Safety Performance Criteria
NSSS	Nuclear Steam Supply System
NUMARC	Nuclear Utility Management and Resources Council
NUREG	Nuclear Regulatory Guides
OCS	Oil Collection System
OCT	Over Current Trip
OL	Operating License
OMA	Operator Manual Action
ORE	Operator Reactor Experiments
OS&Y	Outside Screw and Yoke
OSS	Out of Service
P&ID	Piping and Instrumentation Diagram
PAU	Physical Analysis Unit
PB	Performance-Based
PCS	Primary Control Station
PCS	Primary Control System
PIRT	Phenomena Identification and Ranking Table in NUREG/CR-7150
PM	Preventive Maintenance
PM	Program Manual
PORV	Pilot-Operated Relief Valve
POS	Plant Operating State
PPA	Plant Protected Area
PRA	Probabilistic Risk Assessment
PRACC	PRA Configuration Control
PRAQUANT	Probabilistic Risk Analysis Accent Sequence Quantification Software
PRM	Plant Response Model

PSA	Probabilistic Safety Assessment
PVC	Polyvinyl Chloride
PWR	Power
PWR	Pressurized Water Reactor
PWROG	Pressurized Water Reactor Owners Group
PWST	Primary Water Storage Tank
PZR	Pressurizer
QLS	Qualitative Screening
RA	Recovery Action
RAI	Request for Additional Information
RAM	Radioactive Materials
RAW	Risk Achievement Worth
RC	Reactor Containment
RCA	Radiological Controlled Area
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RECIRC	Recirculation
REF	Reference
RES	Research
RG	Regulatory Guide
RH	Relay House
RI-PB	Risk-Informed, Performance-Based
RIS	Regulatory Issue Summary
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RRA	Radiologically Restricted Area
SAFE	System Assurance and Fire Protection Engineering Software
SAMG	Severe Accident Management Guidance
SB	Service Building
SBO	Station Blackout
SBODG	Station Blackout Diesel Generator Building
SC	Success Criteria
SDC	Shutdown Cooling
SER	Safety Evaluation Report
SFAS	Safety Features Actuation System
SFP	Spent Fuel Pool
SFPE	Society of Fire Protection Engineers
SFRCS	Steam and Feedwater Rupture Control System
SG	Steam Generator
SGTR	Steam Generator
SGW	Steam Generator Warehouse
SLOCA	Small Break Loss of Coolant Accident
SM	Safety Margin
SOKC	State-Of-Knowledge Correlation
SOV	Solenoid-Operated Valve
SR	Supporting Requirements

SRO	Senior Reactor Operator
SRV	Safety Relief Valve
SSA	Safe Shutdown Analysis
SSC	Structure, System, and Component
SSCL	Safe Shutdown Component List
SSD	Safe Shutdown
SSE	Safe Shutdown Earthquake
SSEL	Safe Shutdown Equipment List
SSIE	Support System Initiating Event
SSLD	Safe Shutdown Logic Diagram
SW	Service Water
SWGR	Switchgear
SYS	System
T/H	Thermal/Hydraulic
TAC	Technical Assignment Control
TB	Turbine Building
TBLX	Transient with Extended Loss of Feedwater and Failure of High Pressure Recirculation
TBU	Transient Initiating Event with a Total Loss of Feedwater and Failure of Makeup/HPI Cooling
TBV	Turbine Bypass Valve
Tc	Cold Leg Temperature
TDP	Turbine-Driven Pump
TEMP	Temperature
Th	Hot Leg Temperature
THERP	Technique for Human Error Rate Prediction
TM	Test and Maintenance
TMI	Three Mile Island
TP	Thermoplastic
TPCW	Turbine Plant Cooling Water
TQU	Transient Initiating Event with RCP Seal LOCA and Failure of Injection
TR	Transition Report
TS	Technical Specifications
TS	Thermoset
TSB	Technical Specification Bases
TURB	Turbine
TWR	Tower
UFSAR	Updated Final Safety Analysis Report
UHF	Ultra High Frequency
UL	Underwriters Laboratory
UNCERT	2D and 3D Uncertainty Analysis and Visualization Software
UNL	Unlocated
V&V	Verification and Validation
VFDR	Variances from Deterministic Requirements
VPI	Vacuum Pregnated Insulation

VTI	Vendor Technical Document
WOG	Westinghouse Owners Group
WR	Water
WR	Wide Range
XLPE	Cross-Linked Polyethylene
XMTR	Transmitter
ZOI	Zone of Influence

1.0 INTRODUCTION

The NRC has promulgated an alternative rule for fire protection requirements at nuclear power plants, 10 CFR 50.48(c), National Fire Protection Association Standard 805 (NFPA 805). FENOC is implementing the NEI methodology NEI 04-02, Revision 2, "Guidance for Implementing a Risk-informed, Performance-based Fire Protection Program Under 10 CFR 50.48(c)" (NEI 04-02), to transition Davis-Besse Nuclear Power Station (DBNPS), Unit 1, from its current fire protection licensing basis to the new requirements as outlined in NFPA 805. This report describes the transition methodology utilized and documents how DBNPS complies with the new requirements.

1.1 Background

1.1.1 NFPA 805 – Requirements and Guidance

On July 16, 2004, the NRC amended 10 CFR 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) incorporates by reference, 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 to 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 to assist licensees in adopting NFPA 805 and making the transition from their current fire protection licensing basis to one based on NFPA 805. The NRC issued RG 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light Water Nuclear Power Plants," which endorses NEI 04-02, with exceptions, in December 2009.[1]

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

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[1] Where referred to in this document NEI 04-02 is Revision 2 and RG 1.205 is Revision 1.

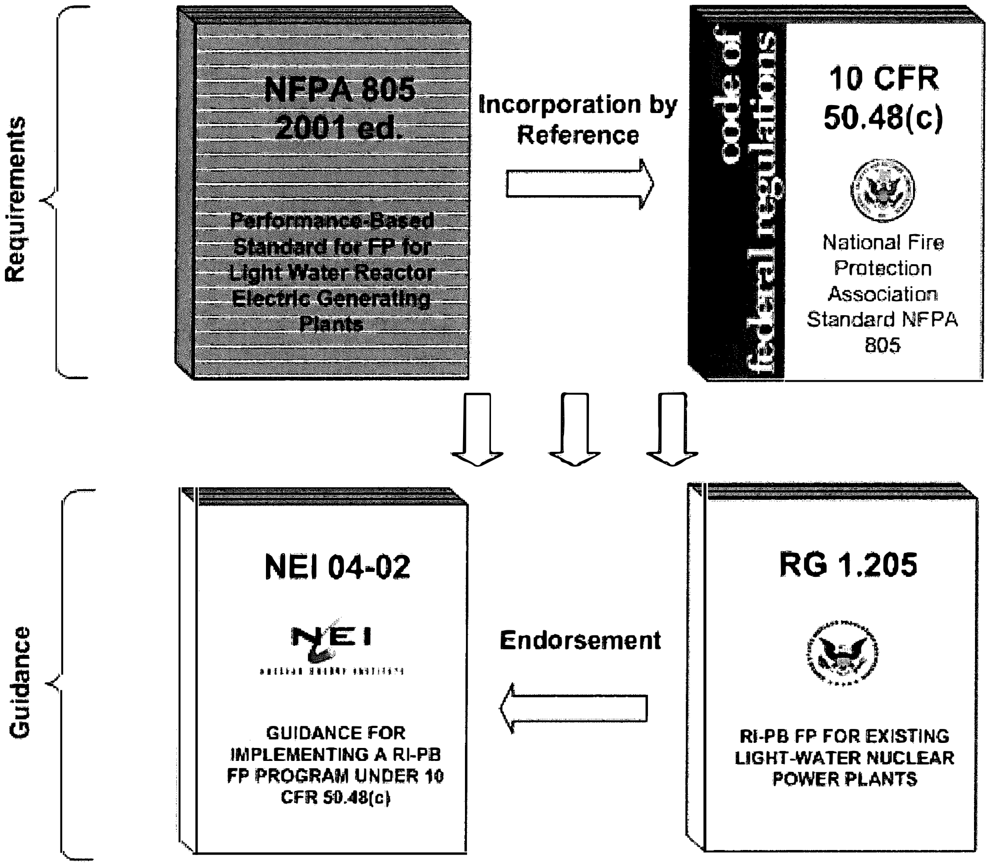

Figure 1-1 NFPA 805 Transition – Implementation Requirements/Guidance

1.1.2 Transition to 10 CFR 50.48(c)

1.1.2.1 Start of Transition

FENOC submitted a letter of intent to the NRC on December 22, 2005 (ML060040259), for DBNPS to adopt NFPA 805 in accordance with 10 CFR 50.48(c).

By letter dated May 01, 2007 (ML071000033), the NRC granted a three-year enforcement discretion period. By letter dated August 1, 2011 (ML112010151), the NRC granted an extension of enforcement discretion for fire protection issues until July 1, 2014. In a letter dated April 1, 2014, FENOC communicated a request to extend the LAR submittal date to December 31, 2015 in accordance with SECY-12-0031. The extension was due to the time required to respond to a Commission Order regarding the Mitigation Strategies for Beyond Design Basis External Events. On June 30, 2015, the NRC issued a confirmatory order that revised the NFPA 805 LAR submittal date and extended the enforcement discretion date to December 31, 2015.

1.1.2.2 Transition Process

The transition to NFPA 805 includes the following high level activities:

- A new Nuclear Safety Capability Assessment (NSCA).

- A new Fire PRA using NUREG/CR 6850, Electric Power Research Institute (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 pre-transition Licensing Basis to 10 CFR 50.48(c) as specified in NEI 04-02 and RG 1.205.
- Modifications implemented at the plant.

1.2 Purpose

The purpose of the Transition Report is to:

1) Describe the process implemented to transition the current fire protection program to comply with the additional requirements of 10 CFR 50.48(c).
2) Summarize the results of the transition process.
3) Explain the bases for conclusions that the fire protection program complies with 10 CFR 50.48(c) requirements.
4) Describe the new fire protection licensing basis.
5) Describe the configuration management processes used to manage post-transition changes to the station and the fire protection program, and resulting impact on the licensing basis.

2.0 OVERVIEW OF EXISTING FIRE PROTECTION PROGRAM

2.1 Current Fire Protection Licensing Basis

DBNPS was licensed to operate on April 22, 1977. As a result, the Davis-Besse Nuclear Power Station, Unit 1, fire protection program is based on compliance with 10 CFR 50.48(a), 10 CFR 50.48(b), 10 CFR 50 Appendix R (Sections III.G, III.J, and III.O), and the following License Condition:

FENOC Davis-Besse Nuclear Power Station, Unit 1, 2.C(4) states:

Fire Protection

FENOC shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in the Updated Safety Analysis Report and as approved in the SERs dated July 26, 1979, and May 30, 1991, subject to the following provision:

FENOC may make changes to the approved Fire Protection Program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

2.2 NRC Acceptance of the Fire Protection Licensing Basis

In response to NRC fire protection program guidance issued in 1976, DBNPS performed a fire hazards analysis that analyzed the DBNPS fire protection program against the guidance of Appendix A to Branch Technical Position (BTP) APCSB 9.5-1. The results of the analysis, in addition to proposed modifications and additions to the fire protection system, were communicated to the NRC by letter dated February 11, 1977, and served as the basis for the Appendix A to BTP APCSB 9.5-1 Safety Evaluation Report (SER), dated July 26, 1979, which issued Amendment 18 to the DBNPS Technical Specifications.

This SER stated that "We find that the Fire Protection Program for Davis-Besse 1, with the improvements already made by the licensee, is adequate at the present time. With the scheduled modifications, the program will meet the guidelines contained in Appendix A of BTP ASB 9.5-1, meets the General Design Criterion 3, and is therefore acceptable."

It further states, "Our overall conclusion is that a fire occurring in any area of the Davis-Besse 1 will not prevent the plant from being brought to a controlled safe cold shutdown, and further, that such a fire would not cause the release of significant amounts of radiation."

On November 19, 1980, the Commission published a revised Section 10 CFR 50.48 and a new Appendix R to 10 CFR 50 regarding fire protection features of nuclear power plants. The revised Section 50.48 and Appendix R became effective on February 17, 1981, and required all reactor plants licensed to operate prior to January 1, 1979 to comply with Section III.G - "Fire Protection of Safe Shutdown Capability," Section III.J - "Emergency Lighting," and Section III.O - "Oil Collection System for Reactor Coolant Pump."

Since the issuance of the fire protection rule, the following exemptions to 10 CFR 50 Appendix R have been approved by the NRC Staff for DBNPS:

- Licensing Action 01: Fire Compartments FF-01, FF-02, and FF-03

  An exemption was approved from Section III.G.3 to the extent that it requires full, fixed fire suppression in an area for which alternate shutdown capability is provided. The alternate shutdown capability is physically and electrically independent of Fire Compartments FF-01, FF-02, and FF-03. The exemption request was transmitted by DBNPS letter dated April 29, 1982. The exemption approval was provided by the NRC in an SER dated November 23, 1982.

- Licensing Action 02: CCW Pump Separation

  An exemption was approved from Section III.G.2 to the extent that it requires separation of redundant SSD components with a 1-hour rated fire barrier where less than 20 feet of separation exists. The component cooling water (CCW) pumps are not separated by a 1-hour rated fire barrier. The exemption request was transmitted by DBNPS letter dated April 29, 1982. The exemption approval was provided by the NRC in an SER dated November 23, 1982. A request to amend the existing exemption from 10 CFR 50, Appendix R, for the CCW heat exchanger and pump room was transmitted by DBNPS letter dated December 21, 2000, and supplemented by letter dated March 12, 2001. The revision to the exemption requested the elimination of the requirement for fire wrap in the CCW pump room. The exemption approval was provided by the NRC in an exemption dated December 26, 2002.

- Licensing Action 03: Fire Door 215 Equivalent Protection

  An exemption was approved from Section III.G.2 to the extent that it requires separation of redundant SSD components by a fire barrier having a 3-hour rating. Door 215 between the two fire areas is not 3-hour rated but provides an equivalent level of protection. The exemption request was transmitted by DBNPS letter dated September 30, 1983, and was supplemented by letter dated December 30, 1983. The exemption approval was provided by the NRC in an exemption dated August 20, 1984.

- Licensing Action 04: Fire Compartments A-04 and A-05

  An exemption was approved from Section III.G.2 to the extent that it requires separation of redundant SSD components by a 3-hour rated fire barrier. Specifically, Train 1 circuits in Rooms 123 and 124 are not separated from Train 2 circuits in Room 115 by a complete 3-hour rated barrier. The exemption request was transmitted by DBNPS letter dated March 6, 1986 and supplemented by letters dated January 12, 1987, January 18, 1989, July 31, 1989, and October 26, 1989. The exemption approval was provided by the NRC in an exemption dated April 18, 1990.

- Licensing Action 05: Fire Compartment AB-01

  An exemption was approved from Section III.G.3 of Appendix R to 10 CFR 50 to the extent that it requires fixed fire suppression in an area where alternate shutdown capability is provided. Specifically, alternate shutdown capability is provided for circuits controlling Emergency Core Cooling System (ECCS) Room Cooler Fans C31-1 and C31-2 within Fire Compartment AB-01 (portion of Appendix R Fire Area AB). The alternate shutdown capability is physically and electrically independent of Fire Compartment AB-01. The exemption request was transmitted by DBNPS letter dated March 6, 1986, and supplemented by letters dated January 12, 1987, January 18, 1989, July 31, 1989, and October 26, 1989. The exemption approval was provided by the NRC in an exemption dated April 18, 1990.

- Licensing Action 06: Fire Compartment D-01

  An exemption was approved from Section III.G.2 of Appendix R to 10 CFR 50 to the extent that it requires the separation of redundant SSD Containment Air Cooler Fans C1-1, C1-2, C1-3 that are located within approximately 10 feet of each other. The exemption request was transmitted by DBNPS letter dated March 6, 1986, and supplemented by letters dated January 12, 1987, January 18, 1989, July 31, 1989, and October 26, 1989. The exemption approval was provided by the NRC in an exemption dated April 18, 1990.

- Licensing Action 07: Fire Compartment EE-01

  An exemption was approved from Section III.G.3 to the extent that it requires area-wide fixed fire suppression in an area for which alternate shutdown capability is provided. Alternate shutdown capability is provided for circuits and electrical components for the Main Steam Inlet Isolation Valve MS106 for the Auxiliary Feedwater Pump Turbine (AFPT) 1. The alternate shutdown capability (motor-driven feedwater pump) is physically and electrically independent of Fire Compartment EE-01 (Appendix R Fire Area EE). The exemption request was transmitted by DBNPS letter dated March 6, 1986 and supplemented by letters dated January 12, 1987, January 18, 1989, July 31, 1989, and October 26, 1989. The exemption approval was provided by the NRC in an exemption dated April 18, 1990.

- Licensing Action 08: Manhole MH3001 Cable Separation

  An exemption was approved from the requirements for fire protection features for Fire Compartment MA-01 (Appendix R Fire Area MA), Manhole 3001, required by Section III.G.2. The exemption request was transmitted by DBNPS letter dated July 31, 1989, and supplemented by letter dated October 26, 1989. The exemption approval was provided by the NRC in an exemption dated April 18, 1990.

- Licensing Action 09: Fire Compartment R-01

  An exemption was approved from Section III.G.3 to the extent that it requires fixed fire suppression in an area for which alternate shutdown capability is provided. Specifically, alternate shutdown capability is provided for circuits controlling the service water pumps and AFPT governor valves within Fire Compartment R-01 (Appendix R Fire Area R). The alternate shutdown capability (in the form of the Backup Service Water Pump and the Motor-Driven Feedwater

Pump) is physically and electrically independent of Fire Compartment R-01. The exemption request was transmitted by DBNPS letter dated March 6, 1986, and supplemented by letters dated January 12, 1987, January 18, 1989, July 31, 1989, and October 26, 1989. The exemption approval was provided by the NRC in an exemption dated April 18, 1990.

- Licensing Action 10: Emergency Lighting

  An exemption was approved from Section III.J to the extent that it requires self-contained emergency lighting units with at least an 8-hour battery power supply in areas needed for the operation of SSD equipment, and in access and egress routes thereto. The exemption is specifically to utilize existing 'hard-wired' alternating current/direct current (AC/DC) essential lighting in portions of the Auxiliary and Turbine Buildings, and to utilize hand-held portable units in outside plant areas. The exemption request was transmitted by DBNPS letter dated March 6, 1986 and supplemented by letters dated January 12, 1987, January 18, 1989, July 31, 1989, and October 26, 1989. The exemption approval was provided by the NRC in an exemption dated April 18, 1990.

- Licensing Action 11: Embedded Conduits

  An exemption was approved from the requirement to have a rated 3-hour barrier separating embedded conduits in concrete from redundant trains of SSD circuits and associated circuits required by Section III.G.2 of Appendix R. The exemption request was transmitted by DBNPS letter dated March 6, 1986, and supplemented by letters dated January 12, 1987, January 18, 1989, July 31, 1989, and October 26, 1989. The exemption approval was provided by the NRC in an exemption dated April 18, 1990.

- Licensing Action 12: Reactor Coolant Pump (RCP) Oil Collection System

  An exemption was approved from Section III.O to the extent that it requires the oil collection system for the RCPs be capable of containing the oil from the four RCPs. The oil collection system is capable of collecting the oil from two RCPs. The exemption request was transmitted by DBNPS letter dated September 30, 1983. The exemption approval was provided by the NRC in an exemption dated August 20, 1984.

  An exemption was also granted to use the remote fill system without a collection system. The underlying purpose of 10 CFR Part 50, Appendix R, Section III.O, is to ensure that leaking oil will not lead to a fire that could damage SSD systems during normal or design basis accident conditions. The exemption request was transmitted by DBNPS letter dated November 18, 1997, and supplemented by letter dated December 9, 1997. The exemption approval was provided by the NRC in an exemption dated January 30, 1998.

- Licensing Action 13: Cold Shutdown Within 72 hours - Withdrawn

  An exemption was approved from Section III.L to the extent it requires that the plant be capable of achieving cold shutdown within 72 hours without the use of offsite power. The exemption request was transmitted by DBNPS letter dated September 30, 1983. The exemption approval was provided by the NRC in an exemption dated August 20, 1984. The request for withdrawal of the exemption was transmitted by DBNPS letter dated December 17, 2003, titled "Withdrawal of 10 CFR 50, Appendix R, Subsection III.L.1, Exemption Regarding Time to Reach Cold Shutdown." The approval of the withdrawal was provided in an NRC letter dated May 12, 2004, titled "Davis-Besse Nuclear Power Station, Unit 1 (TAC No. MC1632).

- Licensing Action 14: Fire Compartment HH-01

  An exemption has been approved from Section III.G.3 to the extent that it requires full, fixed fire suppression and automatic detection in an area for which alternate shutdown capability is provided. The alternate shutdown capability is physically and electrically independent of Fire Compartment HH-01 (Appendix R Fire Area HH). The exemption request was transmitted by DBNPS letter dated January 20, 2004, and supplemented by letters dated September 3, 2004 and February 25, 2005. The exemption approval was provided by the NRC in an exemption dated July 21, 2005.

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 a Safety Evaluation; and
7) Complete implementation of the new licensing basis, including completion of modifications identified in Attachment S.

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. Consistent with the guidance in NEI 04-02, FENOC has implemented the NFPA 805, Section 2.2 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.

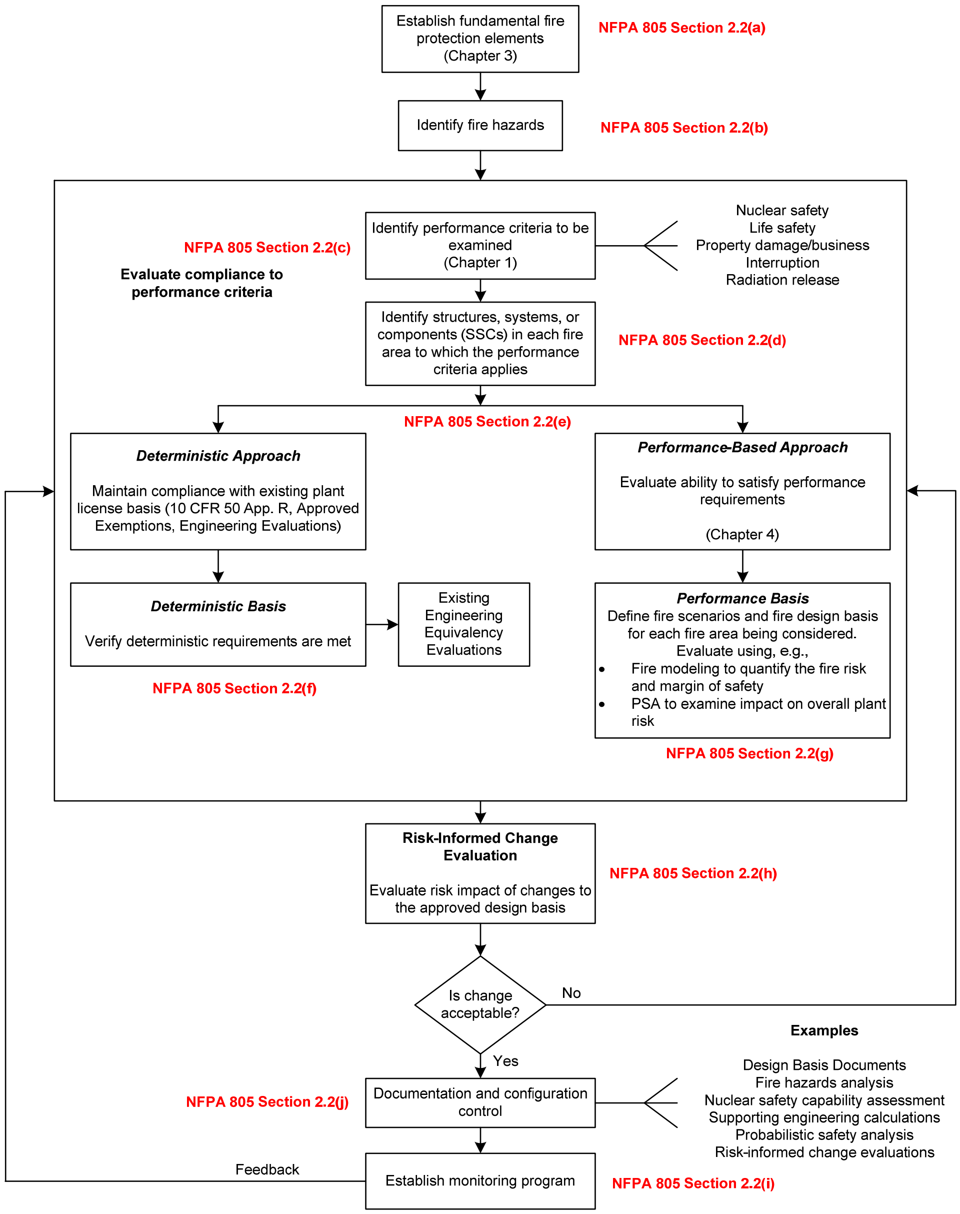

Figure 3-1 NFPA 805 Process [NEI 04-02 Figure 3-1 based on Figure 2-2 of NFPA 805][2]

3.3 NEI 04-02 – NFPA 805 Transition Process

NFPA 805 contains technical processes and requirements for an 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.

[2] Note: 10 CFR 50.48(c) does not incorporate by reference Life Safety and Plant Damage/Business Interruption goals, objectives and criteria. See 10 CFR 50.48(c) for specific exceptions to the incorporation by reference of NFPA 805.

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 3-2.

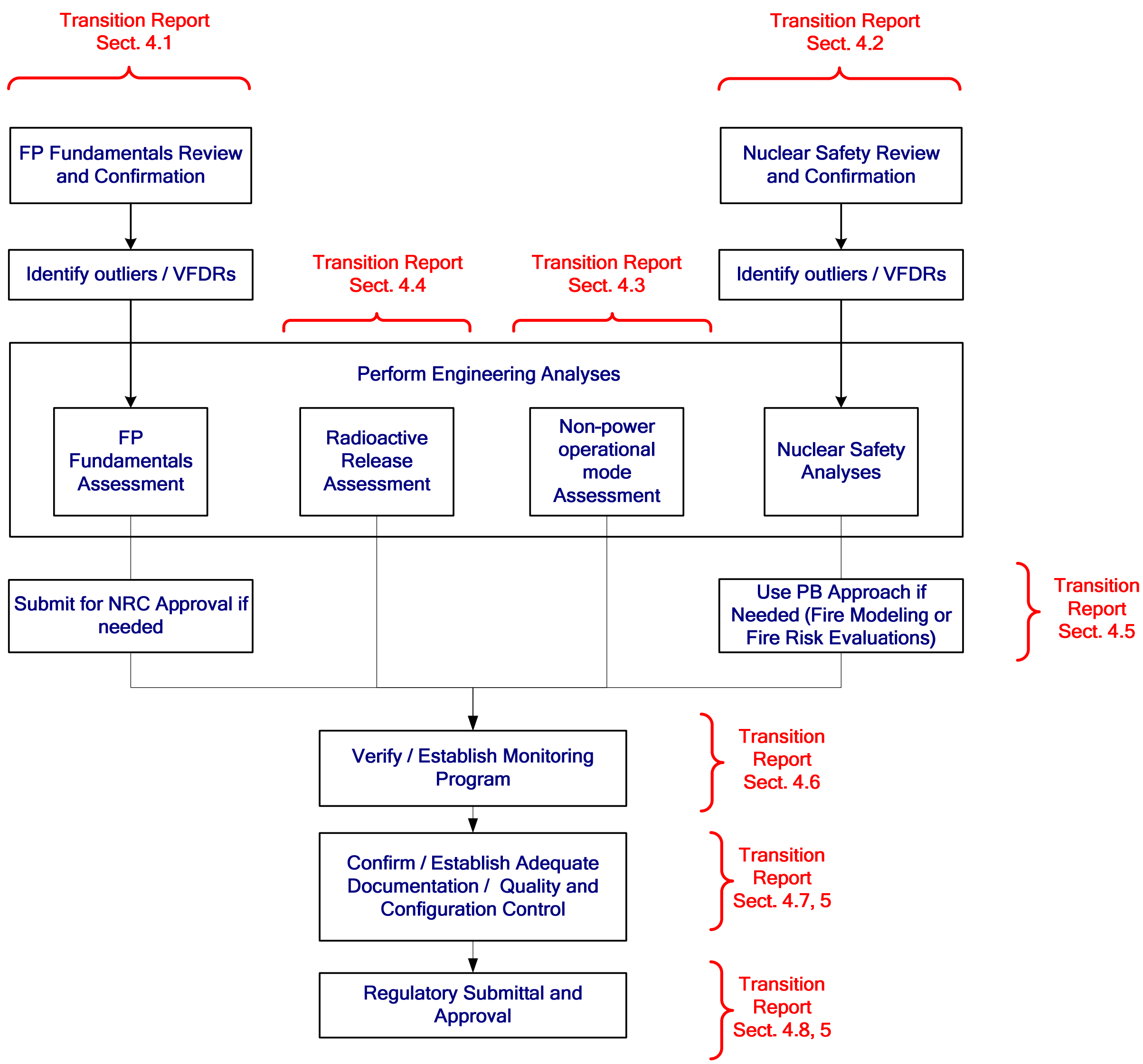

Figure 3-2 Transition Process (Simplified) [based on NEI 04-02 Figure 4-1]

3.4 NFPA 805 Frequently Asked Questions (FAQs)

The NRC has worked with NEI and two Pilot Plants (Oconee Nuclear Station 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, and the requirements of 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, "Process for Communicating Clarifications of Staff Positions Provided in RG 1.205 Concerning Issues Identified during the Pilot Application of NFPA Standard 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 the NEI NFPA 805 Task Force and NRC reach agreement, the NRC issues a memorandum to indicate that the FAQ is 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 plants. Final closure of the FAQs will occur when future revisions of RG 1.205, endorsing the related revisions of NEI 04-02, are approved by the NRC. It is expected that additional FAQs will be written, and existing FAQs will be revised as plants continue NFPA 805 transition after the Pilot Plant Safety Evaluations.

Attachment H contains the list of approved FAQs not yet incorporated into the endorsed revision of NEI 04-02. These FAQs have been used to clarify the guidance in RG 1.205, NEI 04-02, and the requirements of 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 pre-transition licensing basis and plant configuration meet these criteria and for identifying the fire protection program changes that would be necessary for compliance with NFPA 805. NEI 04-02, Appendix B-1 provides guidance on documenting compliance with the program requirements of NFPA 805, Chapter 3.

The DBNPS LAR Table B-1 records were divided into Attachments A1 and A2 records. The Attachment A1 records document NFPA 805, Chapter 3 requirements that are not specific to fire compartments and are globally required throughout the power block. The Attachment A2 records are those fire protection features that are required to meet the nuclear safety performance goals of NFPA 805, Section 4 and are specific to each fire compartment.

The Attachment A1 records demonstrate compliance with NFPA Chapter 3 requirements, excluding NFPA 805, Sections 3.8.2 (Detection), 3.9 (Water-Based Suppression), and 3.11.2, 3.11.3, 3.11.4, and 3.11.5 (Separation). No gaseous suppression systems are transitioning; therefore, the NFPA 805, Chapter 3, Section 3.10 requirements do not apply.

The Attachment A2 records specific to each fire compartment demonstrate compliance with NFPA 805, Sections 3.8.2 (Detection), 3.9 (Water-Based Suppression), and 3.11.2, 3.11.3, 3.11.4, and 3.11.5 (Separation), where these features are credited to meet the performance goals of NFPA 805, Chapter 4. Based on a FENOC document review, DBNPS fire protection feature systems were installed based on design documents per NFPA codes and other applicable standards. The Attachment A2 records evaluate the fire protection features for each fire compartment using the applicable NFPA codes, and provide the detail necessary to meet the requirements of RAI 2-04 (Harris) and RAI 2-09 (Oconee). The Attachment A2 records provide a compliance statement for each credited fire protection feature by fire compartment instead of compliance by feature throughout the entire power block.

4.1.1 Overview of Evaluation Process

The comparison of the DBNPS Fire Protection Program to the requirements of NFPA 805, Chapter 3 was performed in accordance with FENOC Task Instruction ARS-PI-0001, "Task 1.1, Fundamental Fire Protection Program and Design Elements Transition Review," and documented in ARS-DB-10-004, "Transition of Fire Protection Program Design Elements Review," and ARS-DB-11-015, "Task 1.2 - Chapter 3 Fire Area Specific Fire Protection Features Review." ARS-PI-0001, ARS-DB-10-004, and ARS-DB-11-015 used the guidance contained in NEI 04-02, Section 4.3.1, and Appendix B-1. See Figure 4-1.

Each section and subsection of NFPA 805, Chapter 3 was reviewed against the current fire protection program. Upon completion of the activities associated with the review, the following compliance statements were used:

- Complies - For those sections/subsections determined to meet the specific requirements of NFPA 805.
- Complies with Clarification - For those sections/subsections determined to meet the requirements of NFPA 805 with clarification.
- Complies by Previous NRC approval - For those sections/subsections where the specific NFPA 805, Chapter 3 requirements are not met but previous NRC approval of the configuration exists. Previous NRC approval of these configurations/licensing actions are determined to be acceptable for transition to NFPA 805, Chapter 3 and are considered to be compliant under 10 CFR 50.48(c). The specific details of the licensing basis for these configurations are provided in Attachment K (Existing Licensing Action Transition) of the LAR to support the conclusions in Attachments A1 and A2. Those "Previous NRC Approval" items that require further clarification are provided in Attachment T (Clarification of Prior Approvals) of the LAR.
- Complies with Use of Existing Engineering Equivalency Evaluations (EEEEs) - For those sections/subsections determined to be equivalent or adequate for the hazard to the NFPA 805, Chapter 3 requirements as documented by engineering analyses.
- Submit for NRC Approval - For those sections/subsections for which approval is sought in this LAR submittal in accordance with 10 CFR 50.48(c)(2)(vii). A summary of the bases of acceptability is provided. Specific details are provided in Attachment L (Chapter 3 Requirements for Approval).
- Will Comply with the Use of Commitment - For those sections/subsections for which there are processes that must be implemented or components/system(s) that must be installed, modified, or removed prior to the date specified in the NFPA 805 LAR. Specific details are provided in Attachment S (Plant Modifications and Items to be Completed during Implementation).
- Action Required Prior to Bases Being Acceptable for Transition - notices that there are further actions that will be completed before transition.
- N/A - A condition where the site does not have the equipment or process as allowed and/or required by that section of the code. This is also used when the statement after the section number is only a subject heading or a discussion with no listed requirement.

In some cases multiple compliance statements have been assigned to a specific NFPA 805, Chapter 3 section/subsection. Where this is the case, each compliance/compliance basis statement clearly references the corresponding requirement of NFPA 805, Chapter 3.

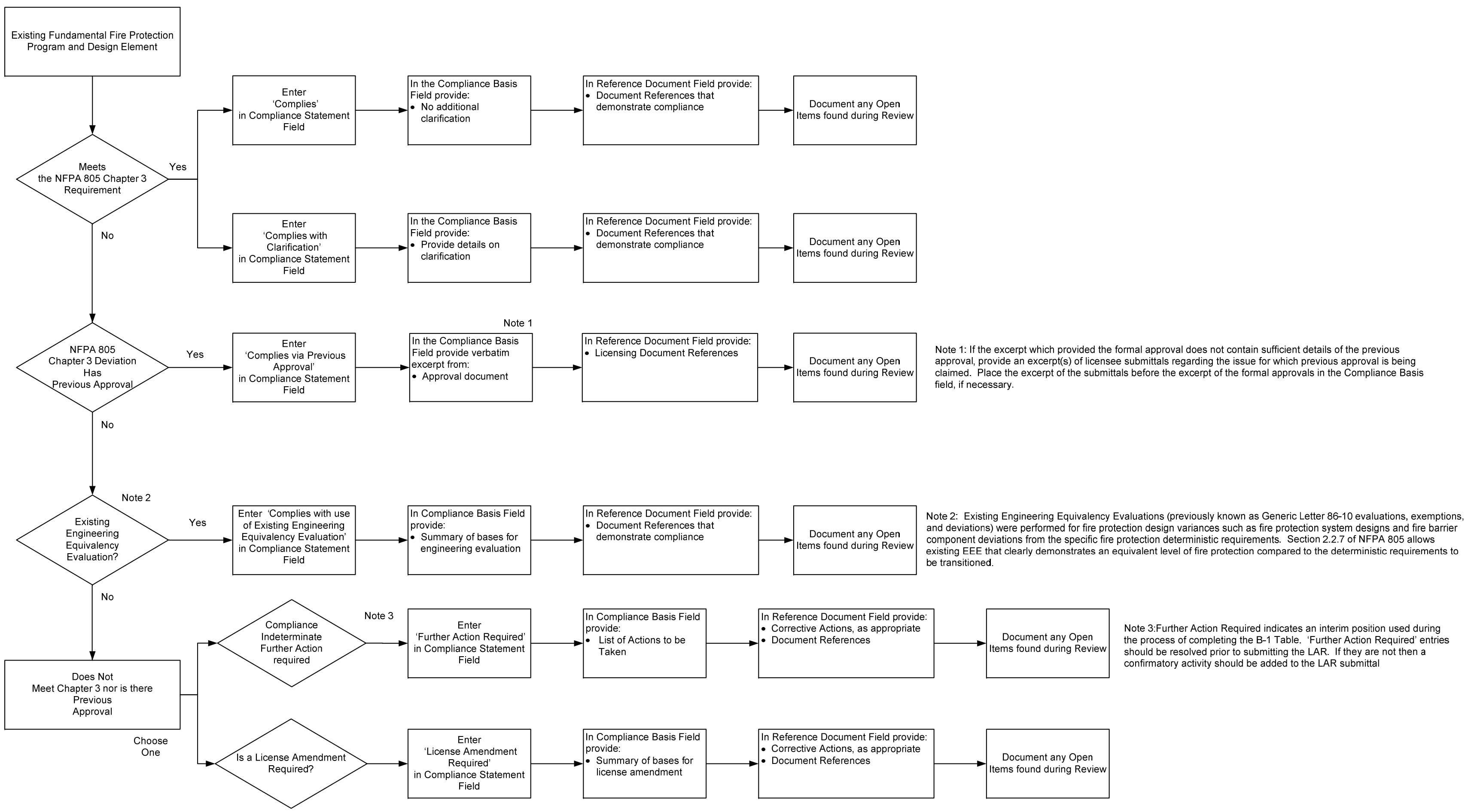

Figure 4-1 - Fundamental Fire Protection Program and Design Elements Transition Process [Based on NEI 04-02 Figure 4-2][3]

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[3] Figure 4-1 depicts the process used during the transition and therefore contains elements (i.e., open items) that represent interim resolutions. Additional detail on the transition of EEEEs is included in Section 4.2.2.

4.1.2 Results of the Evaluation Process

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

Attachments A1 and A2, developed in accordance with ARS-PI-0001, contain the NEI 04-02 Table B-1, "Transition of Fundamental Fire Protection Program and Design Elements." This table provides the compliance basis for the requirements in NFPA 805, Chapter 3. Except as identified in Section 4.1.2.3, Attachments A1 and A2 demonstrate that the fire protection program at DBNPS either:

- Complies directly with the requirements of NFPA 805, Chapter 3,
- Complies with clarification with the requirements of NFPA 805, Chapter 3,
- Complies through the use of EEEEs, which are valid and of appropriate quality,
- Complies with a previously NRC-approved alternative to NFPA 805, Chapter 3, and, therefore, the specific requirement of NFPA 805, Chapter 3 is supplanted,
- Will Comply with the Use of Commitment where there are processes that must be revised, implemented, and/or modifications to be completed for components/systems to meet a specific requirement of NPFA 805. See Attachment S for details.
- N/A - A condition where the site does not have the equipment or process as allowed and/or required by that section of the code. This is also used when the statement after the section number is only a subject heading or a discussion with no listed requirement.

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

NPFA 805 Section 3.1 states in part, "Previously approved alternatives from the fundamental protection program attributes of this chapter by the AHJ take precedence over the requirements contained herein." In some cases prior NRC approval of an NFPA 805, Chapter 3 program attribute may be unclear. FENOC requests that the NRC concur with their finding of prior approval for the following sections of NFPA 805, Chapter 3:

- None.

The discussion of the prior approval, including appropriate reference documents, is provided in Attachment T.

4.1.2.3 NFPA 805 Chapter 3 Requirements Not Met and 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:

- 3.3.5.1 - Approval is requested for the limited use above suspended ceilings of low power electrical wiring that is either non-enclosed or non-plenum rated.

- 3.3.5.3 - Approval is requested for the recognition that the type of cable insulation used throughout the plant meets the intent of IEEE 383 qualification.
- 3.3.12(1) - Approval is requested for reactor coolant pumps (RCP) oil misting.
- 3.3.12(4) - Approval is requested for reactor coolant pumps (RCP) oil misting.
- 3.5.5 - Approval is requested for the remote start circuit separation of the control circuits to the fire pump.
- 3.5.14 - Approval is requested for curb box valves in the fire protection water supply.
- 3.6.3 - Approval is requested for the utilization of adjustable fog nozzles at hose stations which are located outside the high voltage electrical switchgear rooms.
- 3.9.4 - Approval is requested for the lack of automatic sprinkler coverage over the diesel-driven fire pump.
- NFPA 805 Section 4.2.3.3(c) - Approval is requested for the lack of separation of the CCW pumps (Licensing Action 02) that was previously NRC approved.

The specific deviation and a discussion of how the alternative satisfies 10 CFR 50.48(c)(2)(vii) requirements are provided in Attachment L. DBNPS requests NRC approval of these items.

4.1.3 Definition of Power Block and Plant

Where used in NFPA 805 Chapter 3 and in NEI 04-02, Section K.2, “NFPA 805 Chapter 3 'Power Block or Plant' (FAQ 06-0019, ML080510224)," the terms “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, or structures that are identified in the facility’s pre-transition licensing basis.

In support of the DBNPS LAR, an assessment of the pre-transition licensing basis was performed to identify the power block structures and fire compartments to be included in Attachment I for the LAR. This report is constructed in accordance with the NFPA 805, the NEI 04-02 guidance, and 10 CFR 50.48(c).

The following documents were reviewed to establish the power block:

- “Davis-Besse, Unit 1- Fire Hazard Analysis Report,” Section 3.
- C-FP-013.10-007, “Plant Area Boundary and Partitioning.”

The identified structures and compartments were then analyzed for inclusion into the power block. These structures are listed in Attachment I and define the “power block” and “plant."

4.2 Nuclear Safety Performance Criteria

The Nuclear Safety Performance Criteria (NSPC) 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 pre-transition licensing basis meets these criteria and for identifying any necessary fire protection program changes. NEI 04-02, Appendix B-2 provides guidance on documenting the transition of NSCA Methodology and the Fire Area compliance strategies.

4.2.1 Nuclear Safety Capability Assessment Methodology

The NSCA Methodology review consists of four processes:

- Establishing compliance with NFPA 805, Section 2.4.2.
- Establishing the Safe and Stable Conditions for the Plant.
- Establishing Recovery Actions.
- Evaluating Multiple Spurious Operations (MSOs).

The methodology for demonstrating reasonable assurance that a fire during non-power operational (NPO) modes will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition is an additional requirement of 10 CFR 50.48(c) and is addressed in Section 4.3.

4.2.1.1 Compliance with NFPA 805 Section 2.4.2

Overview of Process

NFPA 805 Section 2.4.2 Nuclear Safety Capability Assessment states:

The purpose of this section is to define the methodology for performing a nuclear safety capability assessment. The following steps shall be performed:

(1) Selection of systems and equipment and their interrelationships necessary to achieve the nuclear safety performance criteria in Chapter 1

(2) Selection of cables necessary to achieve the nuclear safety performance criteria in Chapter 1

(3) Identification of the location of nuclear safety equipment and cables

(4) Assessment of the ability to achieve the nuclear safety performance criteria given a fire in each fire area

The NSCA methodology review evaluated the existing post-fire safe shutdown analysis (SSA) methodology against the guidance provided in NEI 00-01, Revision 2 (ML091770265) Chapter 3, "Deterministic Methodology," as discussed in Appendix B-2 of NEI 04-02. The methodology is depicted in Figure 4-2 and consisted of the following activities:

- Each specific section of NFPA 805 2.4.2 was correlated to the corresponding section of Chapter 3 of NEI 00-01, Revision 2. Based upon the content of the NEI 00-01 methodology statements, a determination was made of the applicability of the section to the station.
- The plant-specific methodology was compared to applicable sections of NEI 00-01, and one of the following alignment statements and its associated basis were assigned to the section:

- Aligns
- Aligns with Intent
- Not in Alignment, but Prior NRC Approval
- Not in Alignment, but No Adverse Consequences
- Not Applicable

▪ For those sections that do not align, an assessment was made to determine if the 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. If the section has no adverse consequences, these sections of NEI 00-01 can be dispositioned without further review.

The comparison of the DBNPS existing post-fire NSCA methodology to NEI 00-01 Chapter 3 (NEI 04-02 Table B-2) was performed and documented in ARS-DB-11-007, "Nuclear Safety Capability Assessment Methodology Review (Table B-2)."

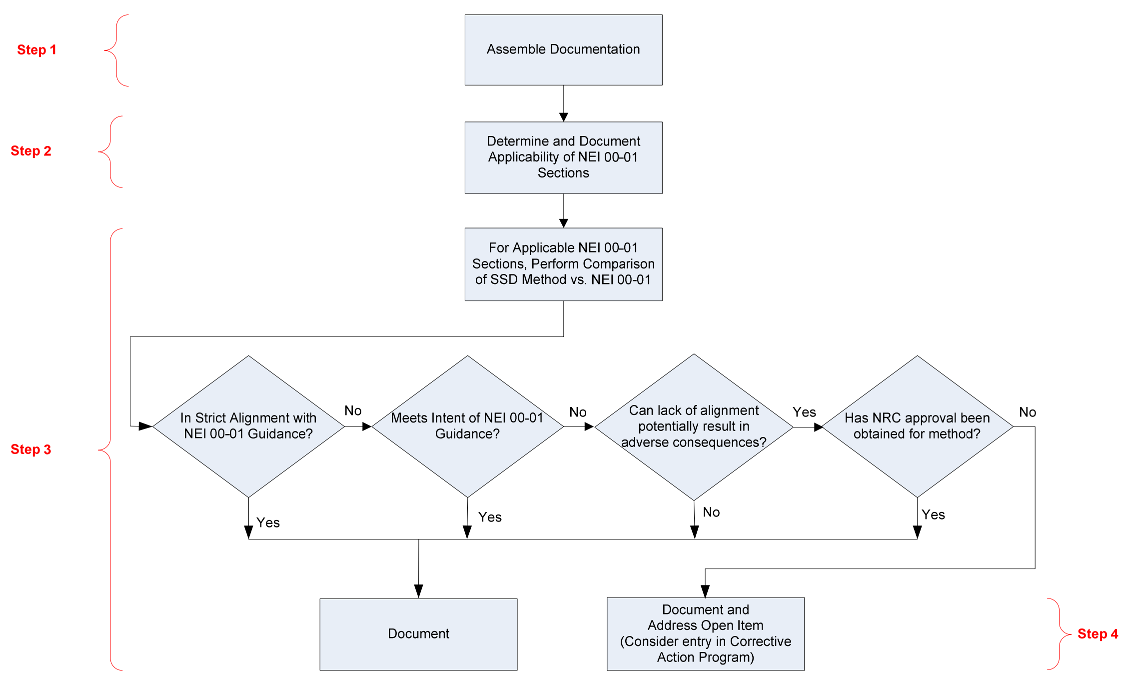

Figure 4-2 – Summary of Nuclear Safety Methodology Review Process (FAQ 07-0039)

Results from Evaluation Process

The method used to perform the existing post-fire NSCA with respect to selection of systems and equipment, selection of cables, and identification of the location of equipment and cables, either meets the NRC-endorsed guidance from NEI 00-01, Revision 2, Chapter 3 directly or met the intent of the endorsed guidance with adequate justification as documented in Attachment B with the following exceptions:

- Manual Actions - The FHAR identifies the components that may require manual actions due to the effects of fire in the affected fire compartment's evaluation. The FHAR methodology is not consistent with this guidance provided in NEI 00-01. Pre-transition operator actions are being transitioned as recovery actions consistent with approved guidance set forth in NEI 04-02 and applicable FAQs; therefore, the new requirements associated with NFPA 805 are satisfied and there are no adverse consequences.
- Spurious Operation Criteria - Industry issues related to MSOs are being addressed during the transition to NFPA 805. Equipment whose spurious operation could affect safe shutdown have been identified. The results of the analysis are in the NFPA 805 Transition Report, Attachment F, Fire-Induced Multiple Spurious Operations Resolution.

4.2.1.2 Safe and Stable Conditions for the Plant

Overview of Process

The nuclear safety goals, objectives, and performance criteria of NFPA 805 allow more flexibility than the previous deterministic programs based on 10 CFR 50 Appendix R and NUREG-0800, Section 9.5-1 (and NEI 00-01, Chapter 3), since NFPA 805 only requires the licensee to maintain the fuel in a safe and stable condition rather than achieve and maintain cold shutdown.

NFPA 805, Section 1.6.56, defines Safe and Stable Conditions as follows:

> *For fuel in the reactor vessel, head on and tensioned, safe and stable conditions are defined as the ability to maintain Keff <0.99, with a reactor coolant temperature at or below the requirements for hot shutdown for a boiling water reactor and hot standby for a pressurized water reactor. For all other configurations, safe and stable conditions are defined as maintaining Keff <0.99 and fuel coolant temperature below boiling.*

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 at or below the temperature defined by a hot standby/hot shutdown plant operating state for the event.

Results

Demonstration of the NSPC for safe and stable conditions was performed in two analyses at DBNPS:

- At-Power analysis, Modes 1 through Mode 3. This analysis is discussed in Section 4.2.4.
- Non-Power analysis, which includes Mode 4 and below. This analysis is discussed in Section 4.3.

The NFPA 805 licensing basis for DBNPS for a safe and stable condition in the event of a fire starting with the reactor in at-power operating Mode 1 (Power Operation), Mode 2 (Startup), and Mode 3 (Hot Standby), is to maintain safe and stable conditions in Hot Standby up to the point at which the Decay Heat (DH) Loop is placed into service. DBNPS will maintain Hot Standby conditions until a decision is made to either place the reactor in a non-power operating mode, (i.e., Hot Shutdown Mode 4 or Cold Shutdown Mode 5) or to return to power operations. Determination of the final state will be based upon the extent of the fire damage, the inventory remaining in the Borated Water Storage Tank (BWST), the ability to provide makeup water to the BWST, and the ability to re-establish inventory in the Condensate Storage Tanks (CSTs) or realign Auxiliary Feedwater (AFW) to its alternate sources. Refer to Attachment C (Table B-3) for the systems and components credited with supporting safe and stable plant conditions by fire area.

As part of the transition to NFPA 805, each fire compartment was evaluated for maintaining safe and stable Hot Standby conditions. The evaluation has determined that DBNPS can achieve and maintain safe and stable conditions with the minimum shift operating staff. If required, the AFW pump suctions can be supplied from the Service Water (SW) System. The necessary valve manipulations to align these sources have adequate procedural guidance and are within the skills and training of the minimum shift operating staff.

With these required actions to maintain the plant in a safe and stable condition performed by the shift operating staff, there is sufficient time for the Emergency Response Organization (ERO) to respond and be available to assess plant conditions and determine the required actions necessary to extend safe and stable Hot Standby conditions. In the event it is determined that a plant cooldown to a non-operating mode is required, the ERO will determine the necessary actions, including maintenance and repairs that are necessary. The ERO may determine the following depending on the initial assessment and continued monitoring of plant conditions:

- Offsite support (e.g., equipment, personnel, supplies) that are needed to continue in a safe and stable condition or to perform a plant cooldown.
- The ERO will be responsible to purchase and have emergency diesel generator (EDG) fuel oil delivered to the site. The plant is able to operate the EDGs at continuous rating for a seven-day period under existing Technical Specifications.
- Expertise of Technical Support Center, Operation Support Center, and Emergency Operations Facility staff. This will include additional maintenance and operations personnel needed to support additional activities deemed necessary by the ERO.
- The ERO will determine the adequacy of existing Emergency Operating Procedures (EOP) and other emergency procedures to assist the operating staff in placing the plant in the desired mode.
- Additional procedures, maintenance instructions, and work orders can be written, planned, and reviewed prior to implementation. These process controls are very

event-specific to the extent that it has been judged to not be useful to develop them in advance due to the limitless spectrum of possibilities.

The following describes methods to maintain safe and stable conditions and related support actions:

- Reactivity Control

  DBNPS reactor core design ensures that Keff is maintained <0.99 while the plant is in a safe and stable condition, including compensation for any positive reactivity increases as a result of Xenon-135 decay and reactor coolant temperature decreases. Gravity insertion of the control rods into the reactor core will ensure reactivity control is achieved.

  Reactor Coolant System (RCS) makeup will be from the BWST, which is a borated source that will ensure the Keff is maintained <0.99 in all operating and non-operating modes.

- Inventory and Pressure Control

  Inventory makeup to the RCS will be required to account for nominal RCS leakage and RCS shrinkage due to cooldown as well as RCP seal injection. DBNPS has design features and procedures to ensure that an adequate source of borated inventory is provided for RCS inventory control from the BWST utilizing the Makeup Pumps (MUP) or the High Pressure Injection (HPI) pumps. If BWST inventory is depleted, it will be refilled using a combination of makeup from the spent fuel pool or makeup tank.

  With fuel in the reactor vessel, head on and tensioned, DBNPS has design features and procedures to ensure inventory and pressure control shall be capable of controlling coolant level such that subcooling is maintained for a Pressurized Water Reactor (PWR) and shall be capable of maintaining reactor water level such that fuel cladding damage as a result of a fire is prevented.

  DBNPS has design features and procedures to ensure that excess RCS inventory is released from the RCS utilizing letdown or the pressurizer vent header.

  DBNPS has design features and procedures to ensure that excess RCS pressure relief is provided utilizing the pressurizer pilot-operated relief valve (PORV) or the pressurizer vent header.

- Decay Heat Removal (DHR)

  DBNPS has design features and procedures to ensure reactor core DH will be rejected to the secondary plant through the steam generators (SG). The heat will be rejected to the atmosphere through the Atmospheric Vent Valves (AVVs).

  DBNPS has design features and procedures to provide adequate AFW to the credited SGs for DHR.

- Vital Auxiliaries - Power and Support Systems

Each EDG is provided with a storage tank having a fuel oil capacity sufficient to operate that diesel for a period of seven days while the EDG is supplying continuous rating load demand. The EDG will provide power to the shutdown equipment for Reactivity Control, Inventory and Pressure Control, DHR, and Process Monitoring. Each EDG will also provide power to the other vital auxiliary systems.

- Process Monitoring

  Adequate indications will be provided to the shift operating staff and ERO to ensure assessment can be made of plant conditions.

Safe and Stable Conditions/Non-Power Operations (NPO) Assessment Interface

DBNPS NPO Assessment provides reasonable assurance that the reactor fuel is maintained in a safe and stable condition for fires which may occur in Mode 4 (Hot Shutdown), Mode 5 (Cold Shutdown) and Mode 6 (Refueling). Refer to LAR Section 4.3 and Attachment D for a description of the DBNPS NPO Assessment for fires that occur in the NPO modes.

4.2.1.3 Establishing Recovery Actions

Overview of Process

NEI 04-02 and RG 1.205 suggest that a licensee submit a summary of its approach for addressing the transition of OMAs as recovery actions in the LAR (Regulatory Position 2.2.1 and NEI 04-02, Section 4.6). 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.

The discussion below provides the methodology used to transition pre-transition OMAs and to determine the population of post-transition recovery actions. This process is based on FAQ 07-0030 (ML110070485) and consists of the following steps:

- Step 1: Clearly define the primary control stations and determine which pre-transition OMAs are taken at primary control stations (Activities that occur in the MCR are not considered pre-transition OMAs). Activities that take place at primary control stations or in the MCR are not recovery actions, by definition.
- Step 2: Determine the population of recovery actions that are required to resolve variances from deterministic requirements (VFDRs) (to meet the risk acceptance criteria or maintain a sufficient level of defense in depth).
- Step 3: Evaluate the additional risk presented by the use of recovery actions required to demonstrate the availability of a success path
- Step 4: Evaluate the feasibility of the recovery actions
- Step 5: Evaluate the reliability of the recovery actions

Results

The DID Expert Panel has determined that all recovery actions listed in Table G-1 are acceptable. A detailed feasibility study has been completed to assess all recovery actions against NFPA 805 acceptance criteria. This included all recovery actions in current procedures and new recovery actions that are required for risk reduction or defense in depth. Procedure updates for the credited NFPA 805 recovery actions and fire area analysis results will be completed as part of LAR implementation (see Attachment S, Table S-2, DB-1941). Confirmatory demonstration of the feasibility for the credited NFPA 805 recovery actions will be performed after procedures are updated and documented as part of LAR implementation (see Attachment S, Table S-2, DB-1941). Training will be updated after completion of the procedures (see Attachment S, Table S-2, DB-1941). Fire brigade drills will be updated after completion of the procedures and training (see Attachment S, Table S-2, DB-1941).

The overall results of the feasibility assessment demonstrate that NFPA 805 recovery actions are creditable.

4.2.1.4 Evaluation of Multiple Spurious Operations

Overview of Process

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. The methodology utilized to address MSOs for DBNPS is summarized below.

As part of the NFPA 805 transition project, a review and evaluation of DBNPS susceptibility to fire-induced MSOs was performed. The process was conducted in accordance with NEI 04-02 and RG 1.205, as supplemented by FAQ 07-0038, Revision 3 (ML110140242). The PWR Generic MSO list dated March 2011 was utilized.

The approach outlined in Figure 4-3 (based on Figure XX from FAQ 07-0038, Revision 3) is one acceptable method to address fire-induced MSOs. This method used insights from the Fire PRA developed in support of transition to NFPA 805 and consists of the following:

- Identifying potential MSOs of concern.
- Conducting an Expert Panel to assess plant specific vulnerabilities (e.g., per NEI 00-01, Revision 1, Section F.4.2).
- Updating the Fire PRA model and NSCA to include the MSOs of concern.
- Evaluating for NFPA 805 Compliance.
- Documenting Results.

This process is intended to support the transition to a new licensing basis. Post-transition changes would use the RI-PB change process. The post-transition change process for the assessment of a specific MSO would be a simplified version of this process, and may not need the level of detail shown in the following section (e.g., An expert panel may not be necessary to identify and assess a new potential MSO. Identification of new potential MSOs may be part of the plant change review process and/or inspection process).

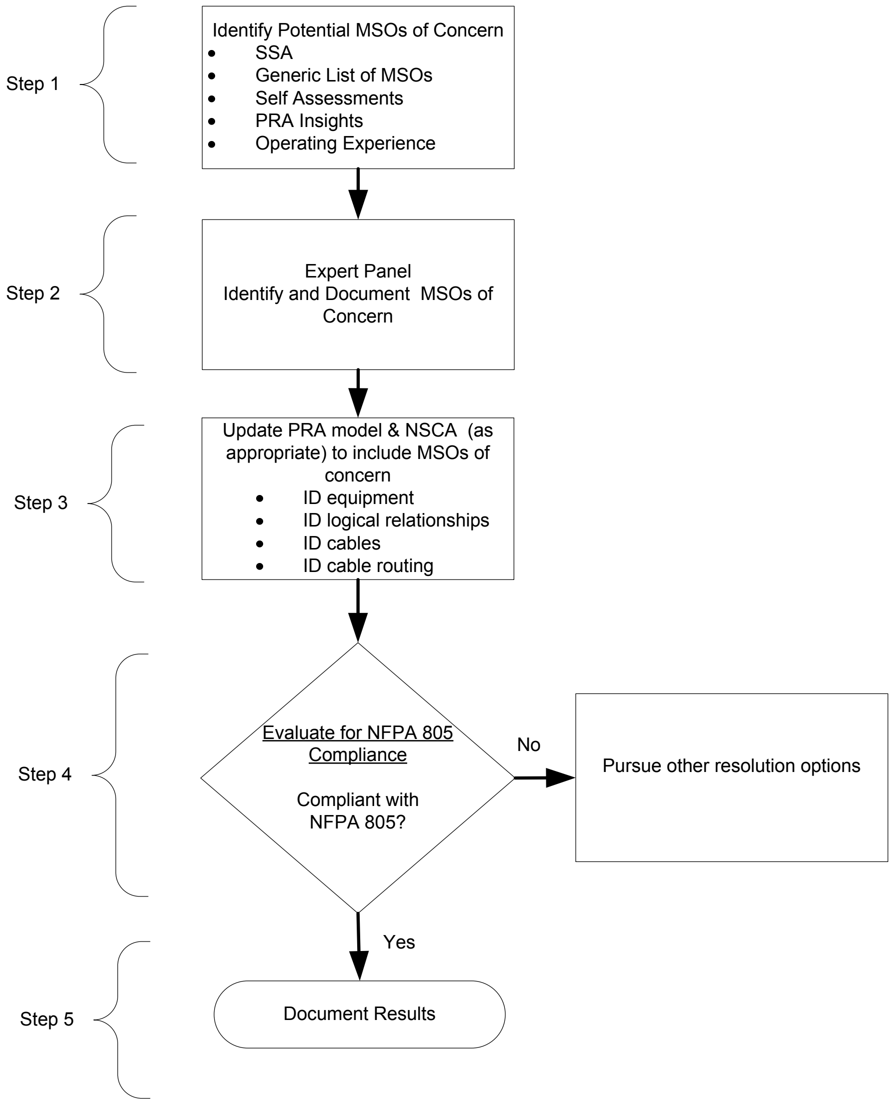

Figure 4-3 – Multiple Spurious Operations – Transition Resolution Process (Based on FAQ 07-0038)

Results

Refer to Attachment F for the process used and the results achieved.

4.2.2 Existing Engineering Equivalency Evaluation Transition

Overview of Evaluation Process

The EEEEs that support compliance with NFPA 805 Chapter 3 or Chapter 4 (both those that existed prior to the transition and those that were created during the transition) were reviewed using the methodology contained in NEI 04-02. The methodology for performing the EEEE review included the following determinations:

- The EEEE is not based solely on quantitative risk evaluations,
- The EEEE is an appropriate use of an engineering equivalency evaluation,
- The EEEE is of appropriate quality,

- The standard license condition is met,
- The EEEE is technically adequate,
- The EEEE reflects the plant as-built condition, and
- The basis for acceptability of the EEEE remains valid.

In accordance with the guidance in RG 1.205, Regulatory Position 2.3.2 and NEI 04-02, as clarified by FAQ 07-0054, Demonstrating Compliance with Chapter 4 of NFPA 805, EEEEs that demonstrate that a fire protection system or feature is “adequate for the hazard” are summarized in the LAR as follows:

- If not requesting specific approval for “adequate for the hazard” EEEEs, then the EEEE was referenced where required, and a brief description of the evaluated condition was provided.
- If requesting specific NRC approval for “adequate for the hazard” EEEEs, then the EEEE was referenced where required to demonstrate compliance and was included in Attachment L for NRC review and approval.

In all cased, the reliance on EEEEs to demonstrate compliance with NFPA 805 requirements was documented in the LAR.

Results

The review results for EEEEs are documented in the following reports:

- ARS-DB-12-029, “Review of Existing Engineering Equivalency Evaluations Report”

In accordance with the guidance provided in RG 1.205, Regulatory Position 2.3.2, NEI 04-02, as clarified by FAQ 07-0054, “Demonstrating Compliance with Chapter 4 of NFPA 805,” EEEEs used to demonstrate compliance with Chapters 3 and 4 of NFPA 805 are referenced in the Attachments A and C, as appropriate.

None of the transitioning EEEEs require NRC approval.

4.2.3 Licensing Action Transition

Overview of Evaluation Process

The existing licensing actions (exemptions) review was performed in accordance with NEI 04-02. 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.
- In addition, variances from the deterministic requirements were identified in the NEI 04 02 Table B-3 (See Attachment C). Some of these variances were subsequently dispositioned via the use of the performance-based approach. A licensing action summary was completed for each fire area using the performance-based approach.

Results

Attachment K contains the detailed results of the Licensing Action Review.

The following licensing actions will be transitioned into the NFPA 805 fire protection program as previously approved (NFPA 805, Section 2.2.7). These licensing actions, with the exception of LA-02 as explained below, are considered compliant under 10 CFR 50.48(c).

- Licensing Action 02 - Lack of separation of redundant SSD components by a 1-hour rated fire barrier in Fire Compartment T-01.

  This exemption requires NRC approval and is being submitted in LAR Attachment L as Approval Item 8. Once approved, this licensing action will be compliant under 10 CFR 50.48(c).
- Licensing Action 03 - Lack of separation of redundant SSD components in Fire Compartments E-01 and F-01 (III.G.2).
- Licensing Action 08 - Lack of separation of redundant train cables in Fire Compartment MA-01 (III.G.2).
- Licensing Action 11 - Lack of separation of embedded conduits in concrete from redundant SSD components.
- Licensing Action 12 - Lack of capability for oil collection system to contain the oil from the RCPs.

The following licensing actions are no longer necessary and will not be transitioned into the NFPA 805 fire protection program:

- Licensing Action 01 - Lack of a fixed fire suppression system in Fire Compartments FF-01, FF-02, and FF-03. This exemption is no longer required because an RI-PB analysis (NFPA 805 4.2.4 Fire Risk Evaluation (FRE)) was performed for this fire area.
- Licensing Action 04 - Lack of separation of redundant SSD components by a 3-hour rated fire barrier in Fire Compartments A-04 and A-05. This exemption is no longer required because an RI-PB analysis (NFPA 805 4.2.4 FRE) was performed for this fire area.
- Licensing Action 05 - Lack of a fixed fire suppression system in Fire Compartments AB-01, AB-02, AB-03, AB-04, AB-05, and AB-06. This exemption is no longer required because an evaluation has shown that ECCS Pump Room Cooler Fans C31-1 through -5 are not required for SSD.
- Licensing Action 06 - Lack of separation of redundant SSD components by a 1-hour rated fire barrier in Fire Compartment D-01. This exemption is no longer required because an RI-PB analysis (NFPA 805 4.2.4 FRE) was performed for this fire area.
- Licensing Action 07 - Lack of a fixed fire suppression system in Fire Compartment EE-01. This exemption is no longer required because an RI-PB analysis (NFPA 805 4.2.4 FRE) was performed for this fire area.

- Licensing Action 09 - Lack of a fixed fire suppression system in Fire Compartment R-01. This exemption is no longer required because an RI-PB analysis (NFPA 805 4.2.4 FRE) was performed for this fire area.
- Licensing Action 10 - Lack of 8-hour battery-powered emergency lighting (III.J criteria). This exemption will not be transitioned, since the 8-hour battery-powered emergency lighting is not a specific NFPA 805 requirement.
- Licensing Action 14 - Lack of a fixed fire suppression system in Fire Compartment HH-01. This exemption is no longer required because an RI-PB analysis (NFPA 805 4.2.4 FRE) was performed for this fire area.

Since the exemptions are either compliant with 10 CFR 50.48(c) or no longer necessary, in accordance with the requirements of 10 CFR 50.48(c)(3)(i), DBNPS requests that the exemptions listed in Attachment K be rescinded as part of the LAR process. It is DBNPS' understanding that implicit in the superseding of the current license condition, all prior fire protection program SERs and commitments will be superseded in their entirety. See Attachment O, "Orders and Exemptions."

4.2.4 Fire Area Transition

Overview of Evaluation Process

The Fire Area Transition (NEI 04-02 Table B-3) was performed using the methodology contained in NEI 04-02 and FAQ 07-0054. The methodology for performing the Fire Area Transition, depicted in Figure 4-4, is outlined as follows:

Step 1 – Assembled documentation. Gathered industry and plant-specific fire area analyses and licensing basis documents.

Step 2 – Documented fulfillment of nuclear safety performance criteria.

- Assessed accomplishment of nuclear safety performance goals. Documented the method of accomplishment, in summary level form, for the fire area.
- Documented evaluation of effects of fire suppression activities. Documented the evaluation of the effects of fire suppression activities on the ability to achieve the nuclear safety performance criteria.
- Performed licensing action reviews. Performed a review of the licensing aspects of the selected fire area and documented the results of the review. See Section 4.2.3.
- Performed existing engineering equivalency evaluation reviews. Performed a review of existing engineering equivalency evaluations (or created new evaluations) documenting the basis for acceptability. See Section 4.2.2.
- Pre-transition OMA reviews. Performed a review of pre-transition OMAs to determine those actions taking place outside of the main control room or outside of the primary control station(s). See Section 4.2.1.3.

Step 3 – VFDR Identification and characterization and resolution considerations. Identified variances from the deterministic requirements of NFPA 805, Section

4.2.3. Documented variances as either a separation issue or a degraded fire protection system or feature. Developed VFDR problem statements to support resolution.

Step 4 – Performance-Based evaluations (Fire Risk Evaluations). See Section 4.5.2 for additional information.

Step 5 – Final Disposition.

- Documented final disposition of the VFDRs in Attachment C (NEI 04-02, Table B-3).
- For recovery action compliance strategies, recovery actions have been reviewed for feasibility by site personnel during Defense in Depth (DID) Expert Panel meetings conducted as part of the Fire Risk Evaluation process.
- Documented the post-transition NFPA 805 Chapter 4 compliance basis.

Step 6 – Documented required fire protection systems and features. Reviewed the NFPA 805 Section 4.2.3 compliance strategies (including fire area licensing actions and engineering evaluations) and the NFPA 805 Section 4.2.4 compliance strategies (including simplifying deterministic assumptions) to determine the scope of fire protection systems and features 'required' by NFPA 805 Chapter 4. The 'required' fire protection systems and features are subject to the applicable requirements of NFPA 805 Chapter 3.

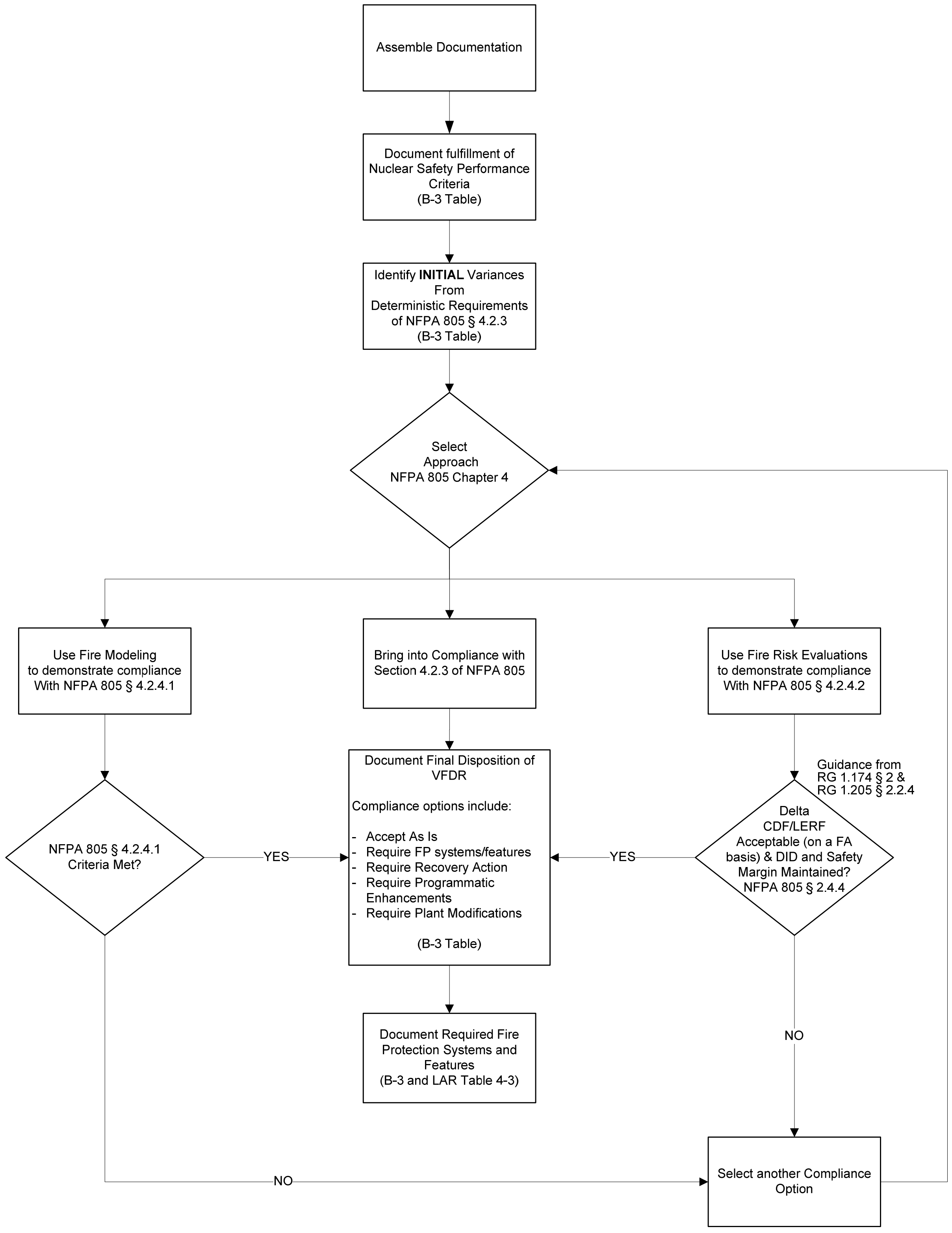

Figure 4-4 – Summary of Fire Area Review [Based on FAQ 07-0054 Revision 1]

Results of the Evaluation Process

Attachment C contains the results of the Fire Area Transition review (NEI 04-02 Table B-3). On a fire area basis, Attachment C summarizes compliance with Chapter 4 of NFPA 805.

NEI 04-02 Table B-3 includes the following summary level information for each fire area:

- Regulatory Basis – NFPA 805 post-transition 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.
- Fire Suppression Activities Effect on Nuclear Safety Performance Criteria – A summary of the method of accomplishment is provided.
- Licensing Actions – Specific references to exemption requests that will remain part of the post-transition licensing basis. A brief description of the condition and the basis for acceptability of the licensing action should be provided. Attachment T contains items for which Davis-Besse Nuclear Power Station is requesting concurrence of prior approval.
- EEEE – Specific references to EEEE that rely on determinations of “adequate for the hazard” that will remain part of the post-transition licensing basis. A brief description of the condition and the basis for acceptability should be provided.
- VFDRs – Specific variances from the deterministic requirements of NFPA 805 Section 4.2.3. Refer to Section 4.5.2 for a discussion of the performance-based approach.

4.3 Non-Power Operational Modes

4.3.1 Overview of Evaluation Process

DBNPS implemented the process outlined in NEI 04-02 and FAQ 07-0040, “Clarification on Non-Power Operations.” The goal (as depicted in Figure 4-5) is to ensure that contingency plans are established when the plant is in an NPO mode where the risk is intrinsically high. During low-risk periods, normal risk management controls and fire prevention/protection processes and procedures will be used.

The process to demonstrate that the NSPC are met during NPO modes involved the following steps:

- Reviewed the existing Outage Management Processes.
- Identified Equipment/Cables:
  - Reviewed plant systems to determine success paths that support each of the Defense-In-Depth Key Safety Functions (KSFs), and
  - Identified cables required for the selected components, and determined their routing.
- Performed Fire Area Assessments (identify pinch points – plant locations where a single fire may damage the success paths of a KSF).

- Managed pinch-points associated with fire-induced vulnerabilities during the outage.

The process is depicted in Figures 4-5 and 4-6. The results are presented in Section 4.3.2.

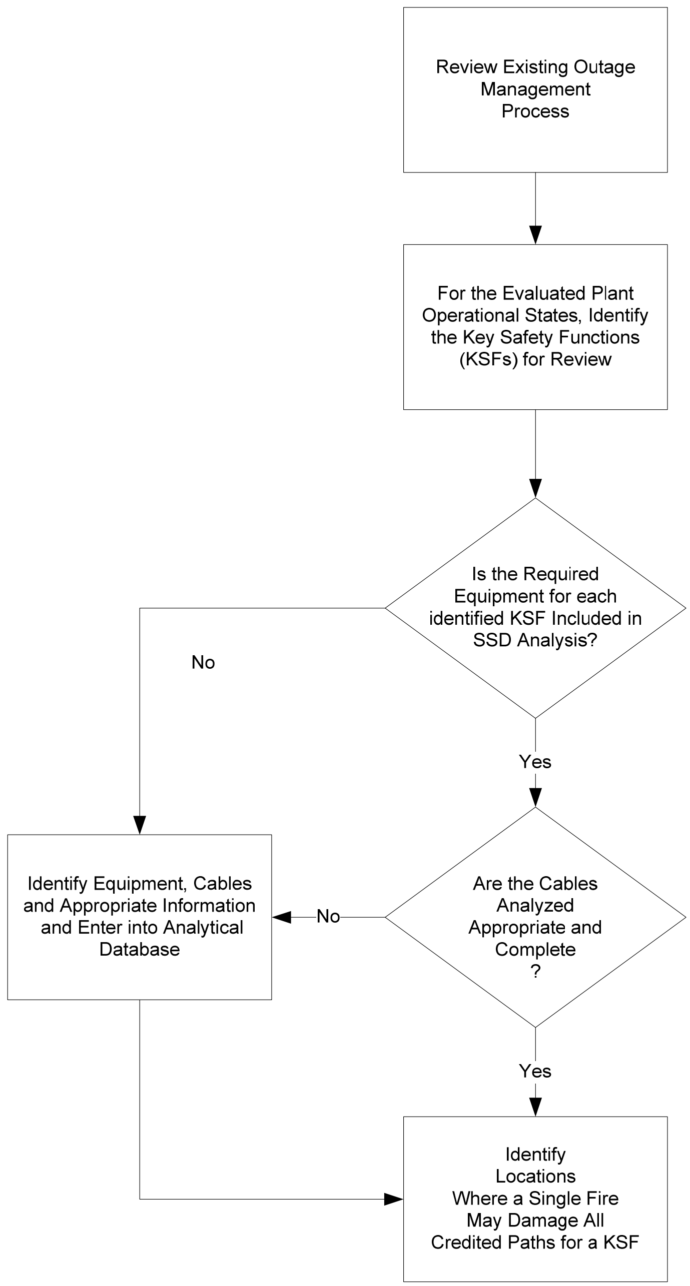

Figure 4-5 Review POSs, KSFs, Equipment, and Cables, and Identify Pinch Points

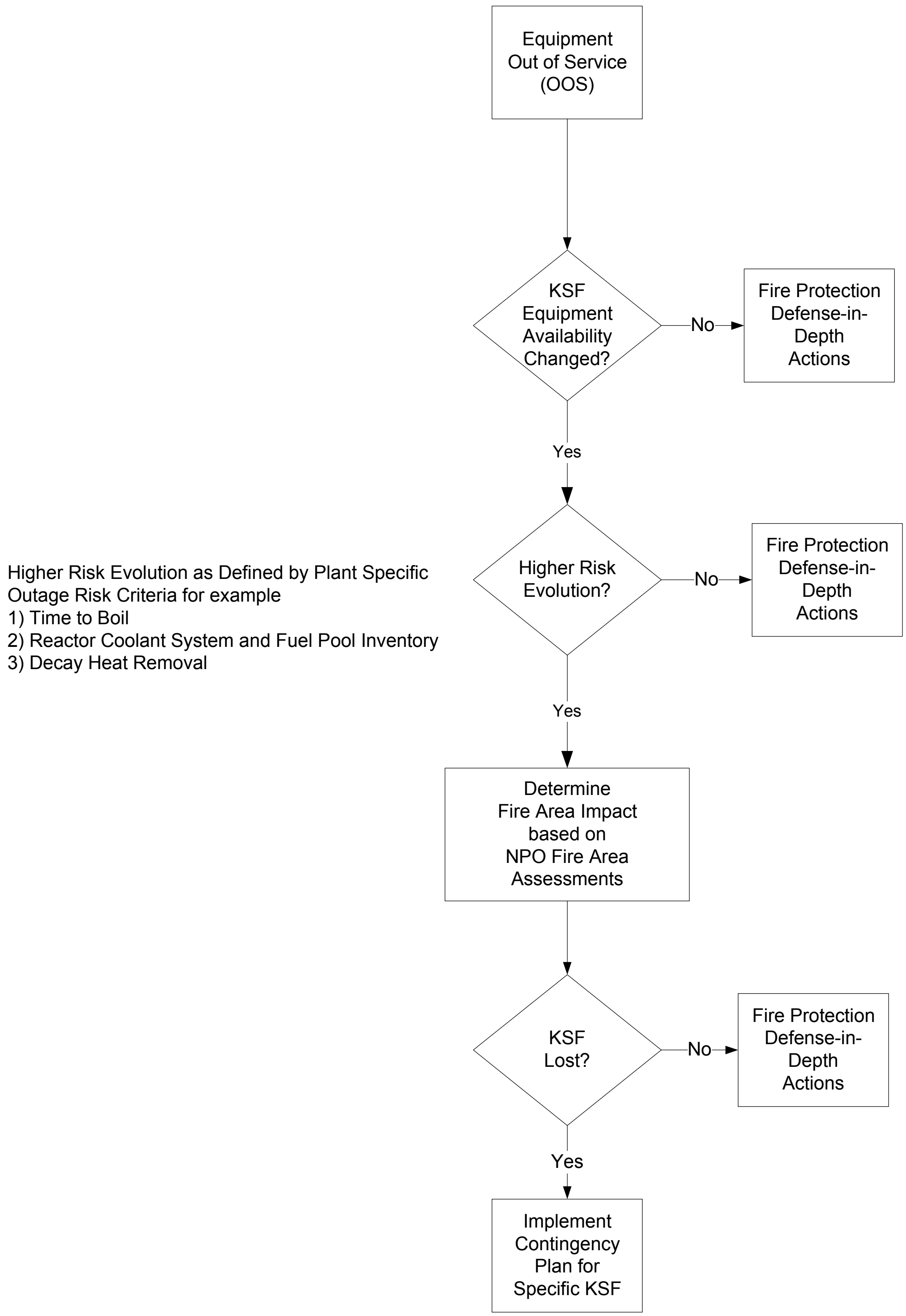

Figure 4-6 Manage Pinch Points

4.3.2 Results of the Evaluation Process

Based on FAQ 07-0040 (Revision 4), the Plant Operating States (POS) considered for equipment and cable selection are defined in ARS-DB-11-003, “Non-Power Operational Modes Transition Report.” Components were identified to support the KSFs of Inventory Control, Decay Heat Removal Capability, Reactivity Control, Containment Closure, and associated support functions (process cooling and electrical power). A model was developed in the NFPA 805 Analysis Database (Genesis Solution Suite, SAFE Module). Equipment was logically tied to the supported KSF. Power supplies, interlocks, and supporting equipment were logically tied to their parent component.

For those components which had not been previously analyzed in support of the at-power analysis or whose functional requirements may have been different for the non-power analysis, cable selection was performed in accordance with approved project procedures. Cables necessary to support the selected function of a component were selected and analyzed for fire impact.

ARS-DB-11-003 also contains the fire area assessment, the identified pinch points, and general recommendations for administrative controls to reduce that fire risk, as well as a proposed strategy for recovering the KSF should a fire occur. In accordance with FAQ 07-0040, any compartment experiencing fire damage which eliminates the success paths for a KSF (without recovery actions outside the MCR) is considered a pinch point. Fire modeling was not used to eliminate any fire compartment from being a pinch point.

The list of generic recommendations considers the following actions from FAQ 07-0040:

- Prohibition or limitation of hot work in fire areas during periods of increased vulnerability.
- Verification of operable detection and/or suppression in the vulnerable areas.
- Prohibition or limitation of combustible materials in fire areas during periods of increased vulnerability.
- Use of plant configuration changes (e.g., removing power from equipment once it is placed in its desired position).
- Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures (such as surveillance cameras) during increased vulnerability.
- Identification and monitoring of in-situ ignition sources for “Fire Precursors” (e.g., equipment temperatures).
- Rescheduling of work to a period of lower risk or higher DID.

Refer to Attachment D for additional details. Based on consideration of the vulnerable areas and incorporation of generic recommendations from FAQ 07-0040 into appropriate plant procedures and practices prior to implementation of NFPA 805 (See Attachment S), the performance goals (KSFs) for Non-Power Operations will be fulfilled, and the requirements of NFPA 805 will be met.

4.4 Radioactive Release Performance Criteria

4.4.1 Overview of Evaluation Process

The review of the fire protection program against NFPA 805 requirements for fire suppression related radioactive release was performed using the methodology contained in project instruction ARS-PI-0009, "Task 4.0 Radiological Release Transition Review During Fire Suppression Activities." The methodology consisted of the following:

- A review of fire pre-plans and fire brigade training materials to identify fire protection program elements (e.g., systems/components/procedural control actions/flow paths, etc.) that are being credited to meet the radioactive release goals, objectives, and performance criteria during all plant operating modes, including full power and non-power conditions.
- A review of engineering controls to ensure containment of gaseous and liquid effluents (e.g., smoke and fire fighting agents). This review included all plant operating modes (including full power and non-power conditions). Otherwise, provided a bounding analysis, quantitative analysis, or other analysis that demonstrates that the limitations for instantaneous release of radioactive effluents specified in the unit's Technical Specifications are met.

4.4.2 Results of the Evaluation Process

The detailed radioactive release review records completed for the applicable DBNPS fire compartments are documented and contained in Attachment E of the Transition Report. The radiological release review determined that radiation release to any unrestricted area due to the direct effects of fire suppression activities (but not involving fuel damage) would be as low as reasonably achievable and would not exceed applicable 10 CFR 20 limits.

Pre-fire Plans:

The pre-fire plans were reviewed for applicability to fixed radiological hazards for each area. Pre-fire plans that address areas where there is no possibility of radiological hazards were screened out from further review.

Applicable pre-fire plans were then evaluated to ensure that the locations that have the potential for radioactive release due to firefighting activities are subject to specific steps for containment and monitoring of potentially contaminated gaseous and liquid effluents. The applicable pre-fire plans will need to be updated to include guidance for ensuring that radioactive materials generated as a direct result of fire suppression activities are contained and monitored prior to release to unrestricted areas. Containment and monitoring will be ensured through elements of the pre-fire plans, fire brigade training, and certain plan features (engineering controls), such as curbs and ventilation systems or actions provided to control smoke management or fire suppression water run-off. This guidance will be incorporated into pre-fire plans and made available for fire brigade use by the scheduled fire protection program implementation date. Enhancements to the pre-fire plans are identified in Attachment S.

Plant Operating Modes - Applicability:

Since fire suppression activities defined in the pre-fire plans and fire brigade firefighting instructions are written for any plant operating mode, the evaluation was performed without consideration for plant operating modes. The pre-fire plans assume the plant is at power operation in terms of identifying specific hazards; however, the strategies employed do not rely on the operational status of the plant and are therefore valid during outage periods as well.

During non-power operations, Reactor Containment openings are internal to the plant. Closure of the Containment for Containment integrity during Modes 5 & 6 is established via a Containment Closure Control plan. The closure plan is in place to meet Technical Specification 3.9.3 requirements during refueling work. Due to the general heightened awareness of personnel and monitoring of containment during this period, the overall potential for a fire with resulting radiological consequences is substantially decreased.

Engineering Controls:

Existing engineering controls, such as use of forced air ventilation and the presence of damming (curbs) for fire suppression agent run-off were considered during review of pre-fire plans. Because radioactive release review considers impact from the fire suppression activities, consideration was provided where suppression activities could potentially adversely impact the engineering controls. Because there are limited engineering controls for some areas, a bounding analysis will be developed to limit radiological releases in the event of a fire.

4.5 Fire PRA and Performance-Based Approaches

RI-PB evaluations are an integral element of an NFPA 805 fire protection program. Key parts of RI-PB evaluations include:

- A Fire PRA (discussed in Section 4.5.1 and Attachments U, V, and W).
- NFPA 805 Performance-Based Approaches (discussed in Section 4.5.2).

4.5.1 Fire PRA Development and Assessment

In accordance with the guidance in RG 1.205, a Fire PRA model was developed for DBNPS in compliance with the requirements of Part 4 “Requirements for Fires At Power PRA,” of the American Society of Mechanical Engineers (ASME) and American Nuclear Society (ANS) combined PRA Standard, ASME/ANS RA-Sa-2009, “Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Application,” (hereafter referred to as PRA Standard). DBNPS conducted a peer review by independent industry analysts in accordance with RG 1.200 prior to a risk-informed submittal. The resulting fire risk assessment model is used as the analytical tool to perform FREs during the transition process.

Section 4.5.1.1 describes the Internal Events PRA model. Section 4.5.1.2 describes the Fire PRA model. Section 4.5.1.3 describes the results and resolution of the peer review of the Fire PRA, and Section 4.5.1.4 describes insights gained from the Fire PRA.

4.5.1.1 Internal Events PRA

The Davis-Besse Nuclear Power Station internal events PRA model (PRA-DB1-AL-R05) was the starting point for the Fire PRA.

In 2008, the DBNPS internal events PRA model underwent a gap assessment, with the assistance of Scientech, against the Capability Category II requirements of ASME PRA Standard Addendum “b” (ASME RA-Sb-2005), as amplified by RG 1.200, Revision 1. Table U-1 contains detailed results of the gap assessments. The ASME PRA standard has been updated since the gap assessment, and the first column in Table U-1 also includes a reference to the current ASME PRA Supporting Requirement (ASME/ANS PRA Standard RA-Sa-2009).

In 2011, the DBNPS Level 2 PRA was evaluated as a Focus Scope Peer Review of the LE element of the ASME PRA Standard. Primary reasons for updating the DBNPS Level 2 model included: resolving gaps; utilizing current industry data sources; ensuring the models reflect current plant configuration and practices; and updating the analysis and documentation to meet the current ASME PRA standard. The detailed results of the peer review are contained in Table U-2.

Gaps and F&Os identified in the peer reviews were addressed in the Revision 5 PRA model (PRA-DB1-AL-R05).

4.5.1.2 Fire PRA

Fire PRA models were developed for DBNPS using guidance provided in NUREG/CR-6850/EPRI TR-1019189, EPRI 1016735, and NUREG-1921. Attachment H provides a listing of the approved FAQs that affect the overall license transition process for DBNPS. The resulting fire risk assessment models are used as the analytical tool to perform FREs during the transition process and to develop estimates of the potential change in fire-related risk associated with those changes. The supporting documents for the Fire PRA have been developed, reviewed by a peer review team, and updated.

The Fire PRA was developed using the Internal Events PRA as a starting point, PRA-DB1-AL-R05. The model has resolved the F&Os identified previously in Section 4.5.1.1. The Internal Events PRA was then modified to capture the effects of fire, both as an initiator of an event and as the subsequent potential failure modes for affected circuits or individual targets. The DBNPS Fire PRA model is documented in a series of reports, calculations, and PRA Notebooks associated with each NUREG/CR-6850 fire PRA task. The Fire PRA quality and results are discussed in the subsequent sections and in Attachments V and W, respectively.

Fire Model Utilization in the Application

Fire modeling was performed as part of the Fire PRA development (NFPA 805, Section 4.2.4.2). RG 1.205, Regulatory Position 4.2 and Section 5.1.2 of NEI 04-02, provide guidance to identify fire models that are acceptable to the NRC for plants implementing a risk-informed, performance-based licensing basis.

The fire models used and the acceptability of their use are included in Attachment J.

4.5.1.3 Results of Fire PRA Peer Review

The DBNPS Fire PRA was peer-reviewed against the requirements of ASME/ANS RA-Sa-2009, Part 4.

The PWR Owners' Group issued reports containing the results of the DBNPS Fire PRA Peer Review conducted in June 2013 (LTR-RAM-13-09). The identification and resolution of the F&Os from the PWR OG Fire PRA Peer Reviews are summarized in Attachment V.

The F&Os from the Fire PRA peer reviews have been addressed either with changes in the Fire Probabilistic Risk Assessment (FPRA) models or supporting documentation, by performing a sensitivity study demonstrating no significant impact on the FPRA, or by tracking and update to the Fire PRA to be incorporated at a future stage of transition development.

4.5.1.4 Risk Insights

Risk insights were documented as part of the development of the Fire PRA. The total plant fire Core Damage Frequency (CDF)/Large Early Release Frequency (LERF) was derived using the NUREG/CR-6850 methodology for fire PRA development and is useful in identifying the areas of the plant where fire risk is greatest. A review of the fire initiating events that collectively represent the calculated fire risk is included as Attachment W.

4.5.2 Performance-Based Approaches

NFPA 805 outlines the approaches for performing performance-based analyses. As specified in Section 4.2.4, there are generally two types of analyses performed for the performance-based approach:

- Fire Modeling (NFPA 805, Section 4.2.4.1).
- Fire Risk Evaluation (NFPA 805, Section 4.2.4.2).

4.5.2.1 Fire Modeling Approach

The fire modeling approach was not utilized for the transition.

4.5.2.2 Fire Risk Approach

Overview of Evaluation Process

The FREs were completed as part of the DBNPS NFPA 805 transition. These FREs were developed using procedure ARS-PI-0035, "Fire Risk Evaluations for Davis-Besse" (600615093 Task 27). This methodology is based upon the requirements of NFPA 805, industry guidance in NEI 04-02, and RG 1.205. These are summarized in Table 4-1.

Table 4-1 Fire Risk Evaluation Guidance Summary Table

Document	Section(s)	Topic
NFPA 805	2.2(h), 4.2.4, A.2.2(h), A.2.4.4, D.5 4.2.4 4.2.4.2	Change Evaluation Risk of Recovery Actions Use of Fire Risk Evaluation
NEI 04-02 Revision 2	4.4 5.3 Appendix B Appendix I Appendix J	Change Evaluation Plant Change Process Transition Assessment Change Evaluation Forms Plant Change Evaluations
RG 1.205 Revision 1	C.2.2.4 C.2.4 C.3.2	Risk Evaluations Recovery Actions Plant Change Evaluation Process

During the transition to NFPA 805, variances from the deterministic approach in Section 4.2.3 of NFPA 805 were evaluated using a Fire Risk Evaluation per Section 4.2.4.2 of NFPA 805. A Fire Risk Evaluation was performed for each fire area containing variances from the deterministic requirements of Section 4.2.3 of NFPA 805 (VFDRs).

If the FRE meets the acceptance criteria, this is confirmation that a success path effectively remains free of fire damage and that the performance-based approach is acceptable per Section 4.2.4.2 of NFPA 805.

The FRE process consists of the following steps. Figure 4-7 depicts the FRE process used during transition. This is generally based on FAQ 07-0054 Revision 1:

Step 1 – Preparation for the Fire Risk Evaluation

- Definition of the Variances from the Deterministic Requirements. The definition of the VFDR includes a description of problem statement, type of VFDR (e.g., separation issue or degraded fire protection system), and proposed evaluation per applicable NFPA 805 section.
- Preparatory Evaluation – Fire Risk Evaluation Team Review. Using the information obtained during the development of the NEI 04-02 B-3 Table and the Fire PRA, a team review of the VFDR was performed. Depending on the scope and complexity of the VFDR, the team may include the Safe Shutdown / NSCA Engineer, the Fire Protection Engineer, and the Fire PRA Engineer. The purpose and objective of this team review was to address the following:
  - Review of the Fire PRA modeling treatment of VFDR, and
  - Ensure discrepancies were captured and resolved.

Step 2 – Performed the Fire Risk Evaluation

- The evaluator coordinated as necessary with the Safe Shutdown/NSCA Engineer, Fire Protection Engineer and Fire PRA Engineer to assess the VFDR using the FRE process to perform the following:

  - Change in Risk Calculation with consideration for additional risk of recovery actions and required fire protection systems and features due to fire risk.
  - Fire area change in risk summary.

Step 3 – Reviewed the Acceptance Criteria

- The acceptance criteria for the FRE consist of two parts. One is quantitatively based and the other is qualitatively based. The quantitative figures of merit are ΔCDF and ΔLERF. The qualitative factors are defense-in-depth and safety margin.
  - Risk Acceptance Criteria. The transition risk evaluation was measured quantitatively for acceptability using the ΔCDF and ΔLERF criteria from RG 1.174, as clarified in RG 1.205 Regulatory Position 2.2.4.
  - Defense-in-Depth. A review of the impact of the change on DID was performed, using the guidance NEI 04-02. NFPA 805 defines DID as:
    - Preventing fires from starting.
    - Rapidly detecting fires and controlling and extinguishing promptly those fires that do occur, thereby limiting damage, and
    - Providing adequate level of fire protection for structures, systems and components important to safety; so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed.

    In general, the DID requirement was considered to be satisfied if the proposed change does not result in a substantial imbalance among these elements (or echelons).

    The review of DID was qualitative and addressed each of the elements with respect to the proposed change. DID was performed on a compartment basis.

    An expert panel consisting of multi-disciplined representatives composed of a manager, a fire protection engineer and at least one individual with operations experience was used to review the FREs. This expert panel ensured there was a balance between the DID echelons, and reduced the imbalances using the optimum combination.

    The actions taken to address DID imbalances included addition of transient combustible exclusion areas, installation of oil containment systems for the unit sub transformers in compartments X-01 and Y-01, additional evaluation of embedded conduit coverage, additional evaluation of substantial barriers between fire compartments, and updating the fire brigade pre-fire plans and training material.

    Fire protection features and systems relied upon to ensure DID were identified as a result of the assessment of DID.
  - Safety Margin Assessment. A review of the impact of the change on safety margin was performed. An acceptable set of guidelines for making that

assessment is summarized below. Other equivalent acceptance guidelines may also be used.

- Codes and standards or their alternatives accepted for use by the NRC are met, and
- Safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) are met, or provide sufficient margin to account for analysis and data uncertainty.

In assessing safety margin, the expert panel reviewed other analyses performed for the transition to NFPA 805 to ensure the fire protection equipment was adequate to meet applicable NFPA codes or exceptions to the NFPA codes were properly documented. The expert panel also reviewed fire modeling and Fire PRA outputs to ensure that these were factored into the FRE determination for adequate safety margin. The expert panel verified in each instance that the performance-based approach safety margin was equal to or greater than the deterministic approach employed per 10 CFR 50, Appendix R. In most instances, the performance-based approach safety margin was greater than the deterministic safety margin since issues associated with the deterministic approach were corrected during the NFPA 805 transition process.

The requirements related to safety margins for the change analysis are described for each of the specific analysis types used in support of the FRE.

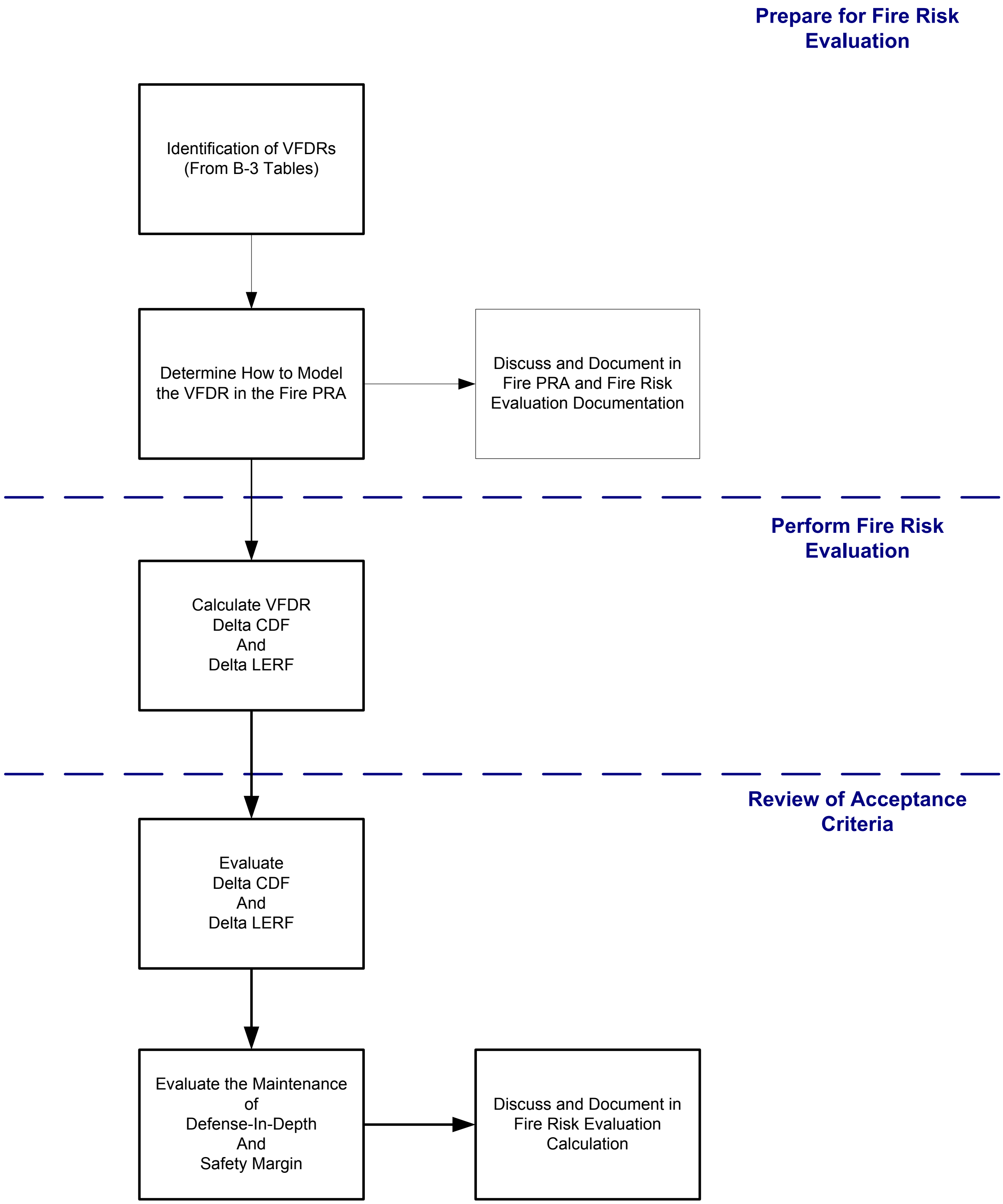

Figure 4-7 – Fire Risk Evaluation Process (NFPA 805 Transition) [Based on FAQ 07-0054 Revision 1]

Results of Evaluation Process

Disposition of VFDRs

The DBNPS existing post-fire SSA/NSCA and the NFPA 805 transition project activities have identified a number of VFDRs of NFPA 805 Section 4.2.3. These variances were dispositioned using the fire risk evaluation process.

Each variance dispositioned using a Fire Risk Evaluation was assessed against the Fire Risk Evaluation acceptance criteria of ΔCDF and ΔLERF; and maintenance of DID and safety margin criteria from Section 5.3.5 of NEI 04-02 and RG 1.205. The results of these calculations are summarized in Attachment C.

Following completion of transition activities and planned modifications and program changes, the plant will be compliant with 10 CFR 50.48(c).

Risk Change Due to NFPA 805 Transition

In accordance with the guidance in RG 1.205, Section C.2.2.4, Risk Evaluations, risk increases or decreases for each fire area using FREs and the overall plant should be provided. Note that the risk increase due to the use of recovery actions was included in the risk change for transition for each fire area.

RG 1.205 Section C.2.2.4.2 states in part:

> *The total increase or decrease in risk associated with the implementation of NFPA 805 for the overall plant should be calculated by summing the risk increases and decreases for each fire area (including any risk increases resulting from previously approved recovery actions). The total risk increase should be consistent with the acceptance guidelines in Regulatory Guide 1.174. Note that the acceptance guidelines of Regulatory Guide 1.174 may require the total CDF, LERF, or both, to evaluate changes where the risk impact exceeds specific guidelines. If the additional risk associated with previously approved recovery actions is greater than the acceptance guidelines in Regulatory Guide 1.174, then the net change in total plant risk incurred by any proposed alternatives to the deterministic criteria in NFPA 805, Chapter 4 (other than the previously approved recovery actions), should be risk neutral or represent a risk decrease.*

The risk increases and decreases are provided in Attachment W.

4.6 Monitoring Program

4.6.1 Overview of NFPA 805 Requirements and NEI 04-02 Guidance on the NFPA 805 Fire Protection System and Feature 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.*

As part of the transition review, the adequacy of the inspection and testing program to address fire protection systems and equipment within plant inspection and the compensatory measures programs should be reviewed. In addition, the adequacy of the plant corrective action program in determining the causes of equipment and programmatic failures and minimizing their recurrence should also be reviewed as part of the transition to a risk-informed, performance-based licensing basis.

4.6.2 Overview of Post-Transition NFPA 805 Monitoring Program

This section describes the process that will be utilized to implement the post-transition NFPA 805 monitoring program. The monitoring program will be implemented after the safety evaluation issuance as part of the fire protection program transition to NFPA 805. See item for implementation in Attachment S (DB-1744). The monitoring process is comprised of four phases.

- Phase 1 – Scoping
- Phase 2 – Screening Using Risk Criteria
- Phase 3 – Risk Target Value Determination
- Phase 4 – Monitoring Implementation

Figure 4-8 provides detail on the Phase 1 and 2 processes.

The results of these phases will be documented as an extension of the FENOC 10 CFR 50.65 Maintenance Rule Program, described in NOP-ER-3004.

Phase 1 – Scoping

In order to meet the NFPA 805 requirements for monitoring, the following categories of SSCs and programmatic elements will be reviewed during the implementation phase for inclusion in the NFPA 805 monitoring program:

- Structures, Systems, and Components (SSCs) required to comply with NFPA 805, specifically:
    - Fire protection systems and features.
        - Required by the NSCA.
        - Modeled in the Fire PRA.
        - Required by Chapter 3 of NFPA 805.
    - NSCA equipment.[4]
        - Nuclear safety equipment.
        - Fire PRA equipment.
        - NPO equipment.
    - SSCs relied upon to meet radioactive release criteria.

[4] For the purposes of the NFPA 805 Monitoring, "NSCA equipment" is intended to include Nuclear Safety Equipment, Fire PRA equipment, and NPO equipment.

- Fire Protection Programmatic Elements.

Phase 2 – Screening Using Risk Criteria

The equipment from Phase 1 scoping will be screened to determine the appropriate level of NFPA 805 monitoring. As a minimum, the SSCs identified in Phase 1 will be part of an inspection and test program and system/program health reporting. If not in the current program, the SSCs will be added in order to assure that the criteria can be met reliably.

The following screening process will be used to determine those SSCs that may require additional monitoring beyond normal inspection and test program and system/program health reporting.

1. Fire Protection Systems and Features

Those fire protection systems and features identified in Phase 1 are candidates for additional monitoring in the NFPA 805 program commensurate with risk significance.

Risk significance is determined at the component, programmatic element, and/or functional level on an individual fire area basis. Compartments smaller than fire areas may be used, provided the compartments are independent (i.e., share no fire protection SSCs).

The Fire PRA is used to establish the risk significance based on the following screening criteria:

Risk Achievement Worth (RAW) of the monitored parameter ≥ 2.0

(AND) either

Core Damage Frequency (CDF) x (RAW) ≥ 1.0E-7 per year

(OR)

Large Early Release Frequency (LERF) x (RAW) ≥ 1.0E-8 per year

CDF, LERF, and $RAW_{(monitored\ parameter)}$ are calculated for each fire area. The "monitored parameter" will be established at a level commensurate with the amenability of the parameter to risk measurement (e.g., a fire barrier may be more conducive to risk measurement than an individual barrier penetration).

Fire protections systems and features that meet or exceed the criteria identified above are considered High Safety Significant (HSS) and will be included in the monitoring program contained in the site Maintenance Rule Program described in NOP-ER-3004, "FENOC Maintenance Rule Program." The remaining required fire protection systems and features will be monitored via the existing inspection and test program and/or in the existing system/program health reporting as described in NOP-ER-2101, "Engineering Program Management."

2. Nuclear Safety Capability Assessment Equipment

Required NSCA equipment, except the NPO scope, identified in Phase 1, will be screened for safety significance using the Fire PRA and the Maintenance Rule guidelines differentiating HSS equipment from Low Safety Significant (LSS) equipment.

The screening will also ensure that the Maintenance Rule functions are consistent with the required functions of the NSCA equipment.

HSS NSCA equipment not currently monitored in Maintenance Rule will be included in the Maintenance Rule. NSCA equipment that is not HSS is considered LSS and need not be included in the monitoring program.

For NPO modes, the qualitative use of fire prevention to manage fire risk during Higher Risk Evolutions (HREs) does not lend itself to quantitative risk measurement. Therefore, fire risk management effectiveness is monitored programmatically, similar to combustible material controls and other fire prevention programs. Additional monitoring beyond inspection and test programs and system/program health reporting is not considered necessary.

3. SSCs Relied upon for Radioactive Release Criteria

The evaluations performed to meet the radioactive release performance criteria are qualitative in nature. The SSCs relied upon to meet the radioactive release performance criteria are not amenable to quantitative risk measurement. Additionally, since 10 CFR Part 20 limits (which are lower than releases due to core damage and containment breach) for radiological effluents are not being exceeded, equipment relied upon to meet the radioactive release performance criteria is considered inherently low risk. Therefore, additional monitoring beyond inspection and test programs and system/program health reporting is not considered necessary.

4. Fire Protection Programmatic Elements

Monitoring of programmatic elements is required in order to “assess the performance of the fire protection program in meeting the performance criteria.” These programs form the bases for many of the analytical assumptions used to evaluate compliance with NFPA 805 requirements Programmatic aspects include:

- Transient Combustible Control.
- Hot Work Control; Administrative Controls.
- Impairment and compensatory measures including program compliance and effectiveness.
- Fire Brigade Effectiveness.

Monitoring of programmatic elements is more qualitative in nature since the programs do not lend themselves to the numerical methods of reliability and availability.

Therefore, monitoring is conducted using the existing system and program health programs. Fire protection health reports, self-assessments, regulator, and insurance company reports provide inputs to the monitoring program.

Phase 3 – Risk Target Value Determination

Phase 3 establishes the target values for reliability and availability for the fire protection systems and features that met or exceeded the screening criteria and the HSS NSCA equipment established in Phase 2.

Target values for reliability and availability for the fire protection systems and features are established at the component level, program level, or functionally through the use of the pseudo system or “performance monitoring group” concept. The actual action level is determined based on the number of component, program or functional failures within a sufficiently bounding time period (~2-3 operating cycles). In addition, the EPRI Technical Report (TR) 1006756, “Fire Protection Surveillance Optimization and Maintenance Guide for Fire Protection Systems and Features” (Reference 28) will be used as input for establishing reliability targets, action levels, and monitoring frequency.

Since the HSS NSCA equipment has been identified using the Maintenance Rule guidelines, the associated equipment-specific performance criteria will be established as in the Maintenance Rule, provided the criteria are consistent with Fire PRA assumptions.

When establishing the action level threshold for reliability and availability, the action level will be no lower than the fire PRA assumptions. Adverse trends and unacceptable levels of availability, reliability, and performance will be reviewed against established action levels. The monitoring program failure criteria and action level targets will be documented in the FENOC Maintenance Rule Periodic Assessment (NOP-ER-3004-04) and Evaluation Forms (NOP-ER-3004-01 and NOP-ER-3004-02).

Note that fire protection systems and features, NSCA equipment, SSCs required to meet the radioactive release criteria, and fire protection program elements that do not meet the screening criteria in Phase 2 will be included in the existing inspection and test programs and the system and program health programs. Reliability and availability criteria will not be assigned.

Phase 4 – Monitoring Implementation

Phase 4 is the implementation of the monitoring program, once the monitoring scope and criteria are established. Monitoring consists of periodically gathering, trending, and evaluating information pertinent to the performance, and/or availability of the equipment and comparing the results with the established goals and performance criteria to verify that the goals are being met. Results of monitoring activities will be analyzed in a timely manner to assure that appropriate action is taken. The corrective action process will be used to address performance of fire protection and nuclear safety SSCs that do not meet performance criteria.

For fire protection systems and features and NSCA HSS equipment that are monitored, unacceptable levels of availability, reliability, and performance will be reviewed against the established action levels. If an action level is triggered, corrective action in accordance with NOP-LP-2001, “Corrective Action Program,” will be initiated to identify the negative trend. A corrective action plan will then be developed to ensure the performance returns to the established level.

When applicable, a sensitivity study can be performed to determine the margin below the action level that still provides acceptable fire PRA results to help prioritize corrective actions if the action level is reached.

A periodic assessment will be performed (e.g., at a frequency of approximately every two to three operating cycles), taking into account, where practical, industry-wide operating experience. This will be conducted as part of the Nuclear Operating Procedure routine Fire Protection Program assessment, which is described in NOP-ER- 2101, Attachment 1. Issues that will be addressed include:

- Review systems with performance criteria. Do performance criteria still effectively monitor the functions of the system? Do the criteria still monitor the effectiveness of the fire protection and NSCA systems?
- Have the supporting analyses been revised such that the performance criteria are no longer applicable, or new fire protection and NSCA SSCs, programmatic elements and/or functions need to be in scope?
- Based on the performance during the assessment period, are there any trends in system performance that should be addressed that are not being addressed?

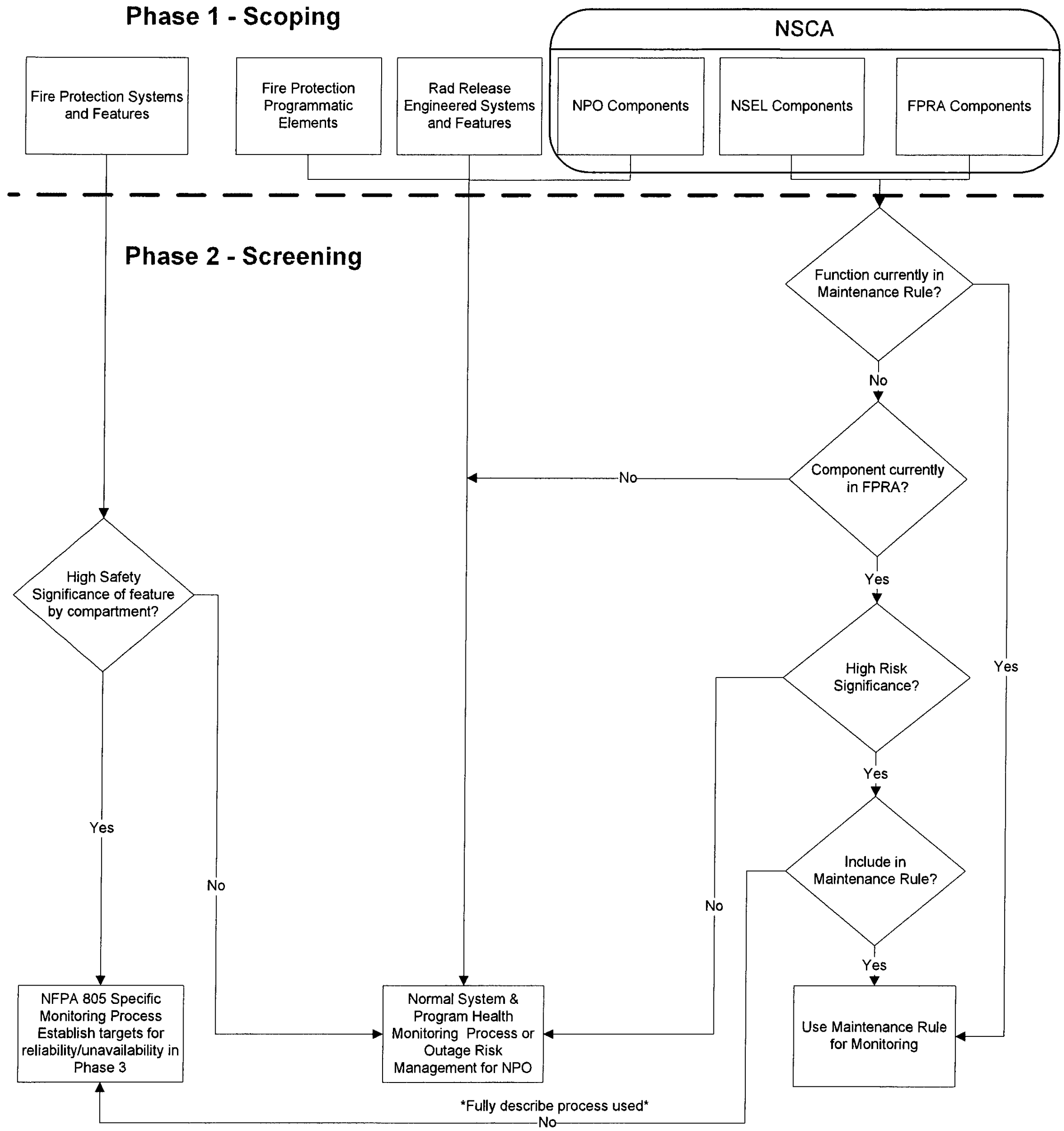

Figure 4-8 – NFPA 805 Monitoring – Scoping and Screening

Since the HSS SSCs have been identified using the Maintenance Rule guidelines, the associated SSC specific performance criteria will be established as in the Maintenance Rule, provided the criteria are consistent with Fire PRA assumptions. The actual action level is determined based on the number of component, program or functional failures within a sufficiently bounding time period (~2-3 operating cycles). Adverse trends and unacceptable levels of availability, reliability, and performance will be reviewed against established action levels. The Monitoring Program failure criteria and action level targets will be documented.

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, DBNPS has documented analyses to support compliance with 10 CFR 50.48(c). The analyses are being performed in accordance with FENOC's processes for ensuring assumptions are clearly defined, that results are easily understood, that results are clearly and consistently described, and that sufficient detail is provided to allow future review of the entire analyses.

Analyses, as defined by NFPA 805, Section 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. Note that these analyses do not include items such as periodic tests, hot work permits, fire impairments, etc.

The Fire Protection Design Basis Document 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 created as part of the transition to 10 CFR 50.48(c) to ensure program implementation following receipt of the safety evaluation. Appropriate cross-references will be established to supporting documents as required by FENOC processes.

4.7.2 Compliance with Configuration Control Requirements in Section 2.7.2 and 2.2.9 of NFPA 805

Program documentation established, revised, or utilized in support of compliance with 10 CFR 50.48(c) is subject to FENOC 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 fire protection program are reviewed appropriately. The RI-PB post-transition change process methodology is based upon the requirements of NFPA 805, and industry guidance in NEI 04-02, and RG 1.205. These requirements are summarized in Table 4-2.

Table 4-2 Change Evaluation Guidance Summary Table

Document	Section(s)	Topic
NFPA 805	2.2(h), 2.2.9, 2.4.4, A.2.2(h), A.2.4.4, D.5	Change Evaluation
NEI 04-02	5.3, Appendix B, Appendix I, Appendix J	Change Evaluation, Change Evaluation Forms (Appendix I)
RG 1.205	C.2.2.4, C.3.1, C.3.2, C.4.3	Risk Evaluation, Standard License Condition, Change Evaluation Process, Fire PRA

The Plant Change Evaluation Process consists of the following four steps and is depicted in Figure 4-9:

- Defining the Change.
- Performing the Preliminary Risk Screening.
- Performing the Risk Evaluation.

- Evaluating the Acceptance Criteria.

Change Definition

The Change Evaluation process begins by defining the change or altered condition to be examined and the baseline configuration as defined by the Design and Licensing Basis (NFPA 805 Licensing Basis post-transition).

1. The baseline is defined as that plant condition or configuration that is consistent with the Design and Licensing Basis (NFPA 805 Licensing Basis post-transition).
2. The changed or altered condition or configuration that is not consistent with the Design and Licensing Basis is defined as the proposed alternative.

Preliminary Risk Review

Once the definition of the change is established, a screening is then performed to identify and resolve minor changes to the fire protection program. This screening is consistent with fire protection regulatory review processes in place at nuclear plants under traditional licensing bases. This screening process is modeled after the NEI 02-03 process. This process will address most administrative changes (e.g., changes to the combustible control program, organizational changes, etc.).

The characteristics of an acceptable screening process that meets the “assessment of the acceptability of risk” requirement of Section 2.4.4 of NFPA 805 are:

- The quality of the screen is sufficient to ensure that potentially greater than minimal risk increases receive detailed risk assessments appropriate to the level of risk.
- The screening process must be documented and be available for inspection by the NRC.
- The screening process does not pose undue evaluation or maintenance burden.

If any of the above is not met, proceed to the Risk Evaluation step.

Risk Evaluation

The screening is followed by engineering evaluations that may include fire modeling and risk assessment techniques. The results of these evaluations are then compared to the acceptance criteria. Changes that satisfy the acceptance criteria of NFPA 805, Section 2.4.4 and the license condition can be implemented within the framework provided by NFPA 805. Changes that do not satisfy the acceptance criteria cannot be implemented within this framework. The acceptance criteria require that the resultant change in CDF and LERF be consistent with the license condition. The acceptance criteria also include consideration of DID and safety margin, which would typically be qualitative in nature.

The risk evaluation involves the application of fire modeling analyses and risk assessment techniques to obtain a measure of the changes in risk associated with the proposed change. In certain circumstances, an initial evaluation in the development of the risk assessment could be a simplified analysis using bounding assumptions, provided the use of such assumptions does not unnecessarily challenge the acceptance criteria discussed below.

Acceptability Determination

The Change Evaluations are assessed for acceptability using the delta CDF (change in CDF) and delta LERF (change in LERF) criteria from the license condition. The proposed changes are also assessed to ensure they are consistent with the DID philosophy and that sufficient safety margins were maintained.

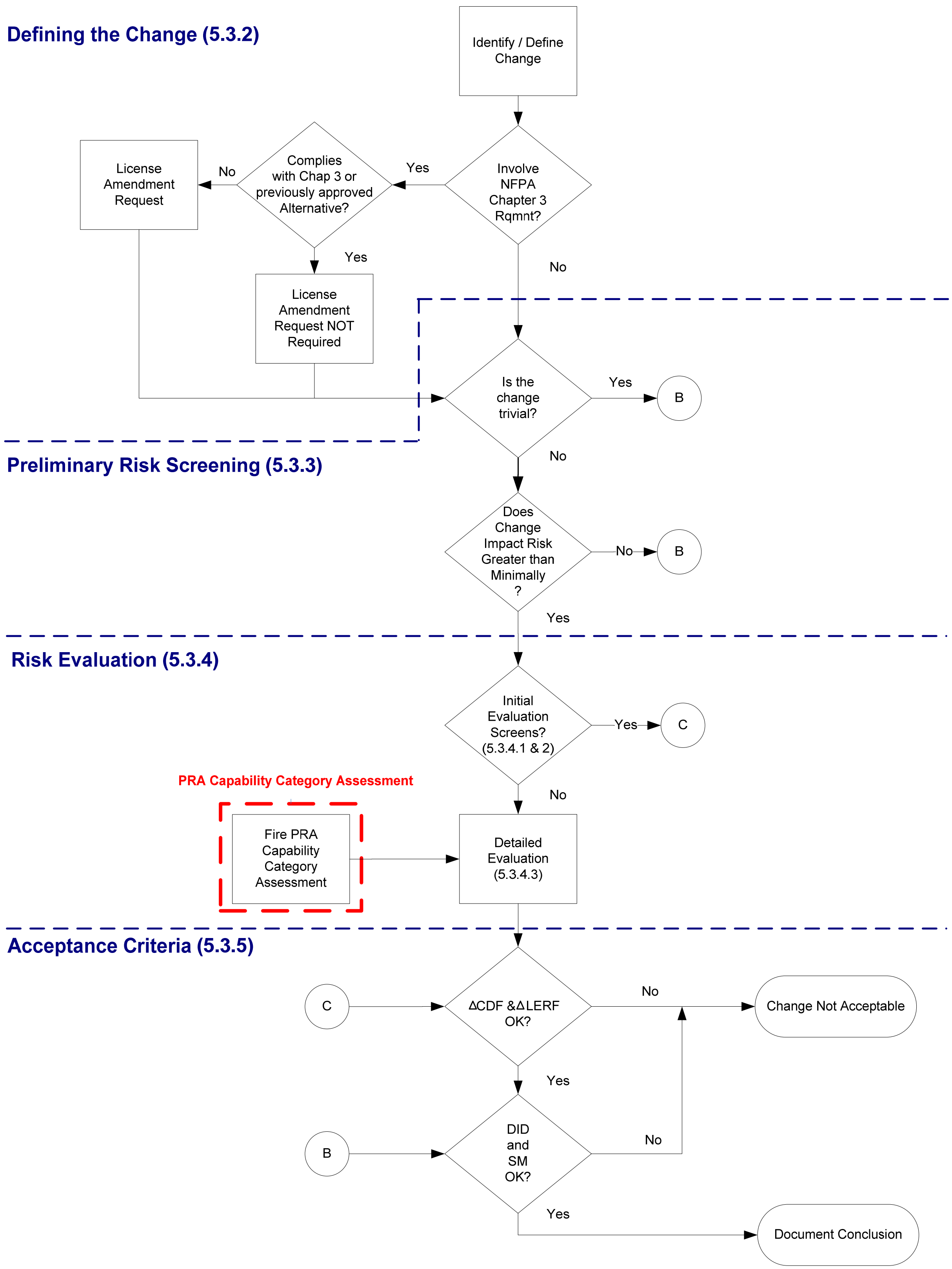

Figure 4-9 Plant Change Evaluation [NEI 04-02 Figure 5-1]
Note references in Figure refer to NEI 04-02 Sections

The DBNPS Fire Protection Program configuration is defined by the program documentation. To the greatest extent possible, the existing configuration control processes for modifications, calculations, and analyses, and Fire Protection Program Licensing Basis Reviews will be utilized to maintain configuration control of the Fire Protection program documents. The configuration control procedures which govern the various DBNPS documents and databases that currently exist will be revised to reflect the new NFPA 805 licensing bases requirements.

Several NFPA 805 document types such as NSCA Supporting Information, Non-Power Mode NSCA Treatment, etc., generally require new control procedures and processes to be developed since they are new documents and databases created as a result of the transition to NFPA 805. The new procedures will be modeled after the existing processes for similar types of documents and databases. System level design basis documents will be revised to reflect the NFPA 805 role that the system components now play.

The process for capturing the impact of proposed changes to the plant on the Fire Protection Program will continue to be a multiple step review. The first step of the review is an initial screening for process users to determine if there is a potential to impact the Fire Protection program as defined under NFPA 805 through a series of screening questions/checklists contained in one or more procedures depending upon the configuration control process being used. Reviews that identify potential Fire Protection program impacts will be sent to qualified individuals (Fire Protection Engineer, SSD/NSCA, Fire PRA) to ascertain the program impacts, if any. If Fire Protection program impacts are determined to exist as a result of the proposed change, the issue would be resolved by one of the following:

- Deterministic Approach: Comply with NFPA 805 Chapter 3 and 4.2.3 requirements
- Performance-Based Approach: Utilize the NFPA 805 change process developed in accordance with NEI 04-02, RG 1.205, and the NFPA 805 fire protection license condition to assess the acceptability of the proposed change. This process would be used to determine if the proposed change could be implemented "as-is" or whether prior NRC approval of the proposed change is required.

This process follows the requirements in NFPA 805 and the guidance outlined in RG 1.174, which requires the use of qualified individuals, procedures that require calculations to be subject to independent review and verification, record retention, peer review, and a corrective action program that ensures appropriate actions are taken when errors are discovered. The following procedures are used to implement this process:

- NOP-NT-00600, “Training and Qualification.”
- NOP-TR-2009, “FENOC Engineering Support Personnel Training.”
- NOP-CC-3002, “Calculations.”
- NOP-CC-2001, “Design Verification.”

- NOP-CC-2004, “Design Interface Reviews and Evaluations.”
- NOP-LP-2001, “Corrective Action Program.”

4.7.3 Compliance with Quality Requirements in Section 2.7.3 of NFPA 805

Fire Protection Program Quality

FENOC will maintain the existing Fire Protection Quality Assurance program.

During the transition to 10 CFR 50.48(c), DBNPS performed work in accordance with the quality requirements of Section 2.7.3 of NFPA 805.

Fire PRA Quality

Configuration control of the Fire PRA model will be maintained by integrating the Fire PRA model into the existing processes used to ensure configuration control of the internal events PRA model. This process complies with Section 1-5 of the ASME PRA Standard and ensures that FENOC maintains an as-built, as-operated PRA model of the plant. The process has been peer-reviewed. Quality assurance of the Fire PRA is assured via the same processes applied to the internal events model.

This process follows the guidance outlined in RG 1.174, which requires the use of qualified individuals, procedures that require calculations be subject to independent review and verification, record retention, peer review, and a corrective action program that ensures appropriate actions are taken when errors are discovered. Although the entire scope of the formal 10 CFR 50 Appendix B program is not applied to the PRA models or processes in general, often parts of the program are applied as a convenient method of complying with the requirements of RG 1.174.

Specifically with regard to uncertainty, an uncertainty and sensitivity matrix was developed and included with DBNPS Fire PRA Notebook 10-06: “Uncertainty and Sensitivity Analysis.” In addition, sensitivity to uncertainty associated with specific Fire PRA parameters was quantitatively addressed in DBNPS Fire PRA Notebook 10-05: “Fire Risk Quantification” and in DBNPS Fire PRA Notebook 10-06: “Uncertainty and Sensitivity Analysis.”

While the removal of conservatism inherent in the Fire PRA is a long-term goal, the Fire PRA results were deemed sufficient for evaluating the risk associated with this application. While FENOC continues to strive toward a more "realistic" estimate of fire risk, use of mean values continues to be the best estimate of fire risk. During the FRE process, the uncertainty and sensitivity associated with specific Fire PRA parameters were considerations in the evaluation of the change in risk relative to the applicable acceptance thresholds.

Specific Requirements of NFPA 805 Section 2.7.3

The following discusses how the requirements of NFPA 805, Section 2.7.3 were met during the transition process. Post-transition, FENOC will perform work in accordance with NFPA 805, Section 2.7.3 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 FENOC 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) were 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 applied 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.

During the transition to 10 CFR 50.48(c), work was performed in accordance with the quality requirements of Section 2.7.3 of NFPA 805. Personnel who used and applied engineering analysis and numerical methods (e.g., fire modeling) in support of compliance with 10 CFR 50.48(c) are competent and experienced as required by NFPA 805, Section 2.7.3.4.

NFPA 805, Section 2.7.3.5 – Uncertainty Analysis

Uncertainty analyses were performed as required by 2.7.3.5 of NFPA 805 and the results were considered in the context of the application. This is of particular interest in fire modeling and Fire PRA development. Note: 10 CFR 50.48(c)(2)(iv) states that NFPA 805, Section 2.7.3.5 is not required for the deterministic approach because conservatism is included in the deterministic criteria.

4.8 Summary of Results

4.8.1 Results of the Fire Area Review

A summary of the NFPA 805 compliance basis and the required fire protection systems and features is provided in Table 4-3. The table provides the following information from the NEI 04-02, Table B-3:

- Fire Compartment: DBNPS Fire Compartment Identifier
- Description: DBNPS Fire Compartment Description
- NFPA 805 Regulatory Basis: Post-transition NFPA 805 Chapter 4 Compliance Basis
- Auto Detection/Auto Suppression/Electrical Raceway Fire Barrier Systems (ERFBS)/Other Required Features/Required Fire Protection Feature and System Details: Features required in the Fire Compartment based on NFPA 805, Chapter

4 compliance. Other Required Features may include cable tray covers, combustible exclusion zones, radiant heat shields, etc. The documentation of required fire protection systems and features does not include the documentation of the fire compartment boundaries. Fire compartment boundaries are required and documentation of the fire compartment boundaries has been performed as part of reviews of engineering evaluations, licensing actions, or as part of the reviews of the NEI 04-02, Table B-1 process. The basis for the requirement of the fire protection system / feature is designated as follows:

- A – Available: Systems/Features are present in the fire compartment, although not necessarily required.
- D – Defense-in-Depth Criteria: Systems/Features required to maintain adequate balance of Defense-in-Depth for a Performance-Based Approach (NFPA 805-2001, Section 4.2.4).
- E – EEEE: Systems/Features required to maintain consistency with the Existing Engineering Equivalency Evaluations' conclusions (NFPA 805-2001, Section 2.2.7).
- L – LA Criteria: NRC approved Licensing Action (i.e., Exemptions/Deviations/Safety Evaluations) (NFPA 805-2001, Section 2.2.7).
- R – Risk Criteria: Systems/Features required to meet the Risk Criteria for the Performance-Based Approach (NFPA 805-2001, Section 4.2.4).
- S – Separation Criteria: Systems/Features required for Chapter 4 separation criteria (NFPA 805-2001, Section 4.2.3).

Attachment W contains the results of the FREs, additional risk of recovery actions, and the change in risk on a fire area basis.

4.8.2 Plant Modifications and Items to be Completed During the Implementation Phase

The Fire PRA model represents the as-built, as-operated, and maintained plant as it will be configured at the completion of the transition to NFPA 805. The Fire PRA model includes credit for the planned implementation of the modifications listed in Attachment S.

Following completion of the implementation items in Attachment S, such as further development of procedure changes and training, additional refinements to the Fire PRA may be warranted. As the Fire PRA refinements are made, some adjustments to the list of recovery actions provided in Attachment G may be warranted prior to completion of implementation. Any changes to the list of recovery actions will be evaluated using the same process used in Attachments G and W of this submittal.

Table S-1 summarizes plant modifications that are committed for implementation. Table S-2 provides a list of those items (procedure changes, process updates, and training of affected plant personnel) that will be completed prior to the implementation of the new NFPA 805 FP program at DBNPS.

DBNPS has not identified any known outstanding plant changes that would require an adjustment to the fire PRA model nor any planned plant changes that would significantly impact the PRA model, beyond those identified and scheduled to be implemented as part of the transition to the 10 CFR 50.48(c) FP program, as set forth in the license condition.

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
A-01	545' Auxiliary Bldg., Southwest	102	Spent Resin Storage Tank Room	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	103	Spent Resin Transfer Pump Room	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	104	Decontamination Area	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	104A	Monorail Area	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	106	Radioactive Equipment Storage	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	106A	Sampling Hood Room	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	107	RC Drain Tank Room	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	108	RC Drain Tank Pump Room	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	109	Maintenance Work Area	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	109A	Passage	4.2.4					
A-01	545' Auxiliary Bldg., Southwest	111	Concentrate Storage Tank Room	4.2.4					

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
A-02	545' Auxiliary Bldg., Southeast	110	Passage	4.2.4	A,R,E			R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
A-02	545' Auxiliary Bldg., Southeast	110A	Passage	4.2.4	A,R,E			R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
A-02	545' Auxiliary Bldg., Southeast	112	Decontamination Area	4.2.4				R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
A-02	545' Auxiliary Bldg., Southeast	116	Misc. Waste Evaporation Room	4.2.4				R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
A-02	545' Auxiliary Bldg., Southeast	117	Waste Evaporation Storage Tank/Pump Room	4.2.4				R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
A-02	545' Auxiliary Bldg., Southeast	117A	Condensate Tank and Pump Room	4.2.4	A,R,E			R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
A-02	545' Auxiliary Bldg., Southeast	119	Degasifier Room	4.2.4				R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
A-02	545' Auxiliary Bldg., Southeast	120	Valve Room	4.2.4				R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
A-02	545' Auxiliary Bldg., Southeast	121	Waste Gas Storage Tank Room	4.2.4				R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
A-02	545' Auxiliary Bldg., Southeast	122	Valve Access Room	4.2.4				R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
A-03	545' Auxiliary Bldg., MWMT Room	114	Misc. Waste Monitoring Tank Room	4.2.4	A		R1	R2	R1: Selected cables are protected by 3-hour rated ERFBS R2: Additional combustible controls
A-04	545' Auxiliary Bldg., No. 2 ECCS Room	115	ECCS Pump Room 1-2	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
A-05	545' Auxiliary Bldg., Waste Tank Rooms	123	Clean Waste Receiver Tank Room	4.2.4					

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
A-05	545' Auxiliary Bldg., Waste Tank Rooms	124	Clean Waste Receiver Tank Room	4.2.4	A,R,E	A,R,E		R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Conduit embedded in concrete
A-05	545' Auxiliary Bldg., Waste Tank Rooms	125	Detergent Waste Drain Tank Room	4.2.4					
A-05	545' Auxiliary Bldg., Waste Tank Rooms	126	Misc. Waste Tank Room	4.2.4					
A-06	Containment Annulus, East	127E	Containment Annulus (East)	4.2.4	A,R,E1		R1	R2	E1: Partial Area Coverage R1: Selected cables are protected by 3-hour rated ERFBS R2: Additional combustible controls
A-07	565' Auxiliary Bldg., No. 2 Mechanical Penetration Room	236	No. 2 Mechanical Penetration Room	4.2.4	A,R,E	A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
A-08	585' Auxiliary Bldg., No. 4 Mechanical Penetration Room	314	No. 4 Mechanical Penetration Room	4.2.4	A,R,E	A,R,L,E	R1	R*,R2,R3,L1	R*: Cable Tray Systems (see notes below) R1: Selected cables are protected by 1-hour rated ERFBS R2: Additional combustible controls R3: Selected cables are protected by 1-hour rated ERFBS L1: Conduit embedded in concrete
A-09	Auxiliary Bldg. Cable Chases	115CC	Cable Chase	4.2.4					
A-09	Auxiliary Bldg. Cable Chases	314CC	Cable Chase	4.2.4	A			R*	
AB-01	545' Auxiliary Bldg., No. 1 ECCS Room and DHR Cooler Room	105	ECCS Pump Room 1-1	4.2.4	A,R			R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
AB-01	545' Auxiliary Bldg., No. 1 ECCS Room and DHR Cooler Room	113	Decay Heat Cooler Room	4.2.4	A,R,E			R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
AB-01	545' Auxiliary Bldg., No. 1 ECCS Room and DHR Cooler Room	113A	Hatch Area	4.2.4	A,R,E			R*,R1,R2	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls R2: Embedded conduit in concrete
AB-02	Containment Annulus, West	127W	Annulus Space (West)	4.2.4	A,R,E1			R1	E1: Partial Area Coverage R1: Additional combustible control
AB-03	565' Auxiliary Bldg., No. 1 Mechanical Penetration Room	202	Pipeway Area	4.2.4	A,R	A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
AB-03	565' Auxiliary Bldg., No. 1 Mechanical Penetration Room	208	No. 1 Mechanical Penetration Room	4.2.4	A,R	A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
AB-03	565' Auxiliary Bldg., No. 1 Mechanical Penetration Room	208DC	Duct Chase	4.2.4				R*	R*: Cable Tray Systems (see notes below)
AB-04	565' Auxiliary Bldg., Make-up Pump Room	225	Make Up Pump Room	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Additional combustible control
AB-04	565' Auxiliary Bldg., Make-up Pump Room	226A	Vestibule	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Additional combustible control
AB-05	585' Auxiliary Bldg., No.3 Mechanical Penetration Room	303	No. 3 Mechanical Penetration Room	4.2.4	A,R	A,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
AB-05	585' Auxiliary Bldg., No.3 Mechanical Penetration Room	303PC	Pipe Chase	4.2.4					
AB-06	Auxiliary Bldg. Stairwell AB-3A	AB-3	Aux. Building Stairwell	4.2.4					
AC-01	BWST & PWST Pipe Trenches	PT	BWST Pipe Trench	4.2.4					
AC-01	BWST & PWST Pipe Trenches	PWST	PWST Trench	4.2.4					

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
AD-01	Decontamination Area, Room 112	118	Auxiliary Building Elevator Machinery Room	4.2.4	A				
AD-01	Decontamination Area, Room 112	AB2	Stairwell AB-2	4.2.4					
AD-01	Decontamination Area, Room 112	EL3	Elevator EL-3	4.2.4					
B-01	Equipment Pipe Chase and Pipe Tunnel	100	Equipment and Pipe Chase	4.2.4	A				
B-01	Equipment Pipe Chase and Pipe Tunnel	101	Pipe Tunnel	4.2.4	A				
BD-01	Screen Wash Pump Room	50	Screen Wash Pump Room	4.2.4					
BD-01	Screen Wash Pump Room	54	Screen Wash Pump Room	4.2.4					
BE-01	Diesel Fire Pump Room and DFP Day Tank Enclosure	51	Diesel Fire Pump Room	4.2.4	A,R,E	A1,R1			A1: Manually actuated system R1: Required to meet 3.9.4 of NFPA 805
BE-01	Diesel Fire Pump Room and DFP Day Tank Enclosure	55	Diesel Fire Pump Tank Enclosure	4.2.4					
BF-01	Service Water Pump Room	52	Service Water Pump Area	4.2.4	A,R,E	A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
BF-01	Service Water Pump Room	52A	Service Water Fan Enclosure	4.2.4				R1	R1: Conduit embedded in concrete
BG-01	Service Water Pipe Tunnel and Valve Rooms	53	Service Water Valve Room	4.2.4	A,R,E	A	R1	R* ,R2	R*: Cable Tray Systems (see notes below) R1: Selected cables are protected by 3-hour rated ERFBS R2: Cables embedded in concrete
BG-01	Service Water Pipe Tunnel and Valve Rooms	53A	Pipe Tunnel-H2O Treatment Building	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
BG-01	Service Water Pipe Tunnel and Valve Rooms	250	Pipe Tunnel	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
BG-01	Service Water Pipe Tunnel and Valve Rooms	251	Valve Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
BH-01	Water Treatment Building, BH	10	Sample Laboratory	4.2.4					
BH-01	Water Treatment Building, BH	11	Substation	4.2.4	A				
BH-01	Water Treatment Building, BH	12	Chemical Storage Room	4.2.4	A				

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
BH-01	Water Treatment Building, BH	12A	Control Room	4.2.4					
BH-01	Water Treatment Building, BH	13	Chlorination Room	4.2.4	A				
BH-01	Water Treatment Building, BH	15	Filter Room	4.2.4	A				
BM-01	DOST and Pumphouse	A3	Diesel Oil Pumphouse	4.2.4	A				
BN-01	EDG Week Tanks	A4	Emergency Diesel Week Tanks	4.2.4					
CC-01	Old RRA Access and Chemistry Lab Areas	411	Corridor	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	411CC1	411 Cable Closet 1	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	411CC2	411 Cable Closet 2	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	411CC3	411 Cable Closet 3	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
CC-01	Old RRA Access and Chemistry Lab Areas	412	Corridor	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	412A	Corridor	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	413	Trace Analysis Lab	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	414	Health Physics Storage	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	415	Corridor	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	417	Hot Shower Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
CC-01	Old RRA Access and Chemistry Lab Areas	417A	Hot Shower Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	418	Decontamination Shower	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	419	Clean Janitor's Closet	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	420	Clean Toilet Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	420A	Shower Area	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	421	Chemistry Turnover Area	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
CC-01	Old RRA Access and Chemistry Lab Areas	422	Vestibule	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	422B	Ladder Space	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	423	Chemistry Oil Testing Labe	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	424	Hot Laboratory	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	424A	Chem. Duty Supervisor's Office	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	424B	Cold Laboratory	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
CC-01	Old RRA Access and Chemistry Lab Areas	424C	Counting Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	425	Instrumentation Calibration Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
CC-01	Old RRA Access and Chemistry Lab Areas	426	Personnel Lock Area	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
D-01	Containment	213	Reactor Area	4.2.4				R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	214	Core Flooding Tank Area	4.2.4	A			R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	215	Let Down Cooler Area	4.2.4	A			R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
D-01	Containment	216	Steam Generator Area	4.2.4	A,L			R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	217	Core Flood Tank Area	4.2.4				R1,R2,R3	R1: Radiant Heat Shield R2: Conduit embedded in concrete R3: Additional combustible controls
D-01	Containment	218	Steam Generator Area	4.2.4	A,L			R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	219	Lower Canal Area	4.2.4				R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	220	Incore Instrument Trench Area	4.2.4	A			R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	315	Tank Area	4.2.4				R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
D-01	Containment	316	Flooding Tank Area	4.2.4				R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	317	Hatch Area	4.2.4	A			R1,R2,R3	R1: Radiant Heat Shield R2: Conduit embedded in concrete R3: Additional combustible controls
D-01	Containment	317A	Emergency Lock Enclosure	4.2.4				R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	407	Hatch Area	4.2.4				R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	410	Passage	4.2.4	A			R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	580	Pressurizer Valve Room	4.2.4	A			R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
D-01	Containment	700	Passage	4.2.4				R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
D-01	Containment	701	Passage	4.2.4				R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
DD-01	Cable Spreading Room	422A	Cable Spreading Room	4.2.4	A	A,R,E		R*	R*: Cable Tray Systems (see notes below)
DF-01	No. 2 Electrical Penetration Room	427	Number 2 Electrical Penetration Room	4.2.4	A,R,E	A,R,L,E		R*,R1,L1	R*: Cable Tray Systems (see notes below) L1: Conduit embedded in concrete R1: Conduit embedded in concrete
DG-01	No. 1 Electrical Penetration Room	402	Number 1 Electrical Penetration Room	4.2.4	A,R,E	A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
DH-01	Main Steam Line Areas	600	Purge Inlet Equipment Room	4.2.4					
DH-01	Main Steam Line Areas	601	Number 1 Main Steam Line Area	4.2.4					
DH-01	Main Steam Line Areas	601A	Number 1 Main Steam Line Area	4.2.4					

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
DH-01	Main Steam Line Areas	602	Number 2 Main Steam Line Area	4.2.4				R1,L1	R1: Conduit embedded in concrete L1: Conduit embedded in concrete
DH-01	Main Steam Line Areas	705	Penthouse	4.2.4					
DH-01	Main Steam Line Areas	706	Penthouse	4.2.4					
E-01	No. 1 Auxiliary Feedwater Pump Room	237	Aux. Feed Pump 1-1 Room	4.2.4	A,R,L,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
EE-01	Auxiliary Bldg. Ventilation Rooms	500	Radwaste and Fuel Handling Area	4.2.4	A,R,E			R*	
EE-01	Auxiliary Bldg. Ventilation Rooms	501	Radwaste Exhaust Fan Room	4.2.4	A,R,E	A,L,E		R*,L1	R*: Cable Tray Systems (see notes below) L1: Conduit embedded in concrete.
EE-01	Auxiliary Bldg. Ventilation Rooms	501DC	Duct Chase	4.2.4				R*	R*: Cable Tray Systems (see notes below)
EE-01	Auxiliary Bldg. Ventilation Rooms	515	Purge Inlet Equipment Room	4.2.4	A,R,E			R*,L1	R*: Cable Tray Systems (see notes below) L1: Conduit embedded in concrete.

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
EF-01	Emergency Feedwater Facility		Emergency Feedwater Facilty Rooms	4.2.4	A1	A1			A1: This is facility is in the planning stage, per modification ECP-13-0195-000
F-01	No. 2 Auxiliary Feedwater Pump Room	238	Aux. Feed Pump 1-2 Room	4.2.4	A,R,E,L			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
FF-01	Control Room Complex	502	Control Cabinet Room	4.2.4	A,E				
FF-01	Control Room Complex	505	Control Room	4.2.4	A,E				
FF-01	Control Room Complex	506	Control Room Toilet	4.2.4	A,E				
FF-01	Control Room Complex	507	Shift Supervisors Office	4.2.4	A,E				
FF-01	Control Room Complex	509	Control Room Passage	4.2.4					
FF-01	Control Room Complex	510	Computer Room	4.2.4	A,E				
FF-01	Control Room Complex	511	Shift Managers Office	4.2.4	A,E				
FF-01	Control Room Complex	512	SS Admin. Assists Office	4.2.4	A,E				

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
FF-01	Control Room Complex	513	Toilet	4.2.4	A,E				
FF-02	Control Room Study Room	503	Operator Study Room	4.2.4	A,E				
FF-03	Control Room Kitchen	504	Control Room Kitchen	4.2.4	A,R,E				
G-01	565' Auxiliary Bldg., CWMT Rooms	200	Clean Liquid Waste Monitoring Tank Room	4.2.4					
G-01	565' Auxiliary Bldg., CWMT Rooms	201	Clean Liquid Waste Monitoring Tank Room	4.2.4					
G-02	565' Auxiliary Bldg., Corridors	203	Clean Waste Monitor Tank Transfer Pump Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Corridors	204	Clean Waste Monitor Tank Filter Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Corridors	205	Make-up Tank Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
G-02	565' Auxiliary Bldg., Corridors	206	Make Up and Purification Filter Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Corridors	207	Mechanical Penetration Room 1 Vestibule	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Corridors	209	Corridor to Mechanical Penetration Room 1	4.2.4	A,R	A		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Corridors	221	Top of Transfer Tube Area	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Corridors	227	Passage	4.2.4	A,R,E	A,R,E		R*,R1,E1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete E1: Combustible Free Zone located on hatch covers.
G-02	565' Auxiliary Bldg., Southeast	228	Demineralizer Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
G-02	565' Auxiliary Bldg., Southeast	230	Demineralizer Filter Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	231	Clean Waste Booster Pump Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	232	Valve Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	233	Demineralizer Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	234	Boric Acid Evaporator Room 1-2	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	235	Boric Acid Evaporator Room 1-1	4.2.4	A,R,E	A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
G-02	565' Auxiliary Bldg., Southeast	240	Boric Acid Addition Tank Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	241	Passage	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	242	Valve Room	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	243	Waste Gas Compressor Room 1-2	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-02	565' Auxiliary Bldg., Southeast	244	Waste Gas Compressor Room 1-1	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
G-03	565' Auxiliary Bldg., SFP Demineralizer and Valve Rooms	210	SFP Demineralizer Room	4.2.4					

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
G-03	565' Auxiliary Bldg., SFP Demineralizer and Valve Rooms	211	Valve Room	4.2.4	A				
G-03	565' Auxiliary Bldg., SFP Demineralizer and Valve Rooms	212	Valve Room	4.2.4	A				
HH-01	Control Room AC Equipment Room and Elevator No. 2	603	AC Equipment Room	4.2.4	A,R,E			R1,R2	R1: Conduit embedded in concrete R2: Additional combustible controls
HH-01	Control Room AC Equipment Room and Elevator No. 2	603A	Records and Storage Area	4.2.4					
HH-01	Control Room AC Equipment Room and Elevator No. 2	603B	Vestibule	4.2.4					
II-01	Turbine Building	245	Cooling Water Tank Room	4.2.4					
II-01	Turbine Building	246	Condenser Pit	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	247	Heater Drains Valve Room	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
II-01	Turbine Building	248	Condensate Demineralizer Hold Up Tank Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	249	Lube Oil Storage Tank Room	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	249DC	Turbine Building Duct Chase	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	252	Feed Water Pump Room	4.2.4		A,R,L		R*,L1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete L1: Conduit embedded in concrete.
II-01	Turbine Building	253	Condensate Pump Pit	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	254	Storage Area	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
II-01	Turbine Building	326	Heater Bay Area	4.2.4		A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Outside Areas	330	Vestibule	4.2.4					Outside concrete vestibule attached to Turbine Building entrance door.
II-01	Turbine Building	334	Turbine Pedestal Area	4.2.4		A,R,L,E		R*,R1,L1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete L1: Conduit embedded in concrete.
II-01	Turbine Building	334A	Demineralizer Back Wash Tank Area	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	334B	Plant Chemistry Lab	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	346	Janitors Closet	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
II-01	Turbine Building	348	Circulating Water Pump House	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	430	Heater Bay Area	4.2.4		A,R,L		R*,R1,L1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete L1: Conduit embedded in concrete.
II-01	Turbine Building	431	Turbine Area	4.2.4		A,R,L,E		R*,R1,L1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete L1: Conduit embedded in concrete.
II-01	Turbine Building	431A	Condensate Demineralizer Area	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	508	Control Room Vestibule	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
II-01	Turbine Building	514	Heater Bay Area	4.2.4		A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	517	Turbine Operating Floor	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	517A	Battery Rack Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	517B	Battery Charger Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	518A	Fire Brigade Locker Room	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	518B	Met Lab	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
II-01	Turbine Building	604	Heater Bay Area	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-01	Turbine Building	707	Heater Bay Area	4.2.4		A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit Embedded in concrete
II-02	Auxiliary Boiler Room	331	Auxiliary Boiler Room	4.2.4		A,R,E			
II-03	Seal Oil Room	333	Seal Oil Room	4.2.4	A	A			
II-04	Maintenance High Bay area	335	Welding Area	4.2.4		A,R			
II-04	Maintenance High Bay area	336	Main Workshop	4.2.4		A,R			
II-04	Maintenance High Bay area	336A	Tool Crib	4.2.4		A,R			
II-04	Maintenance High Bay area	336B	Supply Storage	4.2.4		A,R			
II-04	Maintenance High Bay area	336C	Maintenance Foreman Office	4.2.4					
II-04	Maintenance High Bay area	338	Toilet	4.2.4					
II-04	Maintenance High Bay area	339	Maintenance Office	4.2.4					

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
II-04	Maintenance High Bay area	340	Storekeeper Room	4.2.4		A,R			
II-04	Maintenance High Bay area	340A	Electrical Foreman Office	4.2.4		A,R,E			
II-04	Maintenance High Bay area	341	Main Tool Room	4.2.4		A,R			
II-05	Oil Drum Storage Room	337	Oil Drum Storage Room	4.2.4		A,R			
II-06	Condensate Storage Tank Room	345	Condensate Storage Tank Room	4.2.4					
II-07	Lube Oil Filter Room	347	Lube Oil Filter Room	4.2.4		A,R			
II-08	Turbine Lube Oil Tank Room	432	Turbine Lube Oil Tank Room	4.2.4		A,R,E			
II-09	Non-Radwaste Supply Air and Exhaust Equipment Room	516	Non-Radwaste Supply Air and Exhaust Equipment Room	4.2.4	A				
J-01	No. 2 Emergency Diesel Generator Room	319	Diesel Generator 1-2 Room	4.2.4	A,R	A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
J-01	No. 2 Emergency Diesel Generator Room	319A	Diesel Generator 1-2 Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
J-02	No. 2 EDG Day Tank Room	320A	Day Tank 1-2 Room	4.2.4	A	A,R			
K-01	No. 1 Emergency Diesel Generator Room	318	Diesel Generator 1-1 Room	4.2.4	A,R,E	A,R		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
K-01	No. 1 Emergency Diesel Generator Room	318UL	Diesel Generator 1-1 Room	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
K-02	No. 1 EDG Day Tank Room	321A	Day Tank 1-1 Room	4.2.4	A	A,R			
MA-01	Manhole MH3001	MH3001	Manhole MH3001	4.2.4				L	
MB-01	Manhole MH3004	MH3004	Manhole MH3004	4.2.4					
MC-01	Manhole MH3005	MH3005	Manhole MH3005	4.2.4					
ME-01	Manhole MH3041	MH3041	Manhole MH3041	4.2.4					
MF-01	Manhole MH3042	MH3042	Manhole MH3042	4.2.4					
MG-01	Junction Box JB30D4	JB30D4	Junction Box JB30D4	4.2.4					
MH-01	Manhole MH3009	MH3009	Manhole MH3009	4.2.4					
OS	Outside Areas	30	Misc. Diesel Room	4.2.4					
OS	Outside Areas	31	Oil Tank Room	4.2.4					
OS	Outside Areas	703	Passage Elevator to No. 2	4.2.4					

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
OS	Outside Areas	A5	H2 Trailer Park Area	4.2.4					
OS	Outside Areas	A6	Permanent H2 Area	4.2.4					
OS	Outside Areas	AFE	Aux Feedwater Exhaust	4.2.4					
OS	Outside Areas	N/A	N2 Storage Building	4.2.4					
OS	Outside Areas	N/A	Transformer Area	4.2.4		A			
OS	Outside Areas	N/A	Borated Water Storage Tank	4.2.4					
OS	Outside Areas	N/A	Switchyard	4.2.4					
OS	Outside Areas	N/A	Primary Water Storage Tank	4.2.4					
OS	Outside Areas	N/A	Station Blackout Diesel	4.2.4	A,R1	A,R2			R1: Rooms SBODG-3 & 4 ONLY R2: Rooms SBODG-1 & 2 ONLY
OS	Outside Areas	OS	Outside Areas	4.2.4					
OS	Outside Areas	PSF	Personnel Shop Facility	4.2.4					
OS	Outside Areas	RH	Relay House	4.2.4	A				
OS	Outside Areas	SB2	Service Building #2	4.2.4					
P-01	Maintenance Room 320	320	Maintenance	4.2.4	A,R,E				
P-02	Charge Room 321	321	Charge Room	4.2.4	A,R,E				

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
P-03	Passage to Diesel Generator Rooms	322	Passage to Diesel Generator Rooms	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Additional combustible controls
Q-01	High Voltage Switchgear Room B	323	High Voltage Switchgear Room B	4.2.4	A,R		R1	R*,R2,L1	R*: Cable Tray Systems (see notes below) R1: ERBS for cable 1PBE107 B is 3-hour fire rated. R2: Conduit embedded in concrete L1: Conduit embedded in concrete
R-01	Auxiliary Shutdown Panel Room and Duct Chase	324	Aux. Shut Down Panel and Transfer Switch Room	4.2.4	A,R		R1	R2,L1	R1: ERBS for cable 2CAD108 K is 3-hour fire rated. R2: Conduit embedded in concrete L1: Conduit embedded in concrete
R-01	Auxiliary Shutdown Panel Room and Duct Chase	324DC	Duct Chase	4.2.4					
S-01	High Voltage Switchgear Room A	325	High Voltage Switchgear Room A	4.2.4	A,R			R*	R*: Cable Tray Systems (see notes below)

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
T-01	Component Cooling Water Pump Room	328	CCW Heat Exchanger and Pump Room	4.2.4	A,R,E,L	A,R,E,L		R1,L1	R1: Conduit embedded in concrete L1: curbing around the base of the CCW pumps to control an oil spill and motor baffles to keep out water from the sprinkler system
U-01	Spent Fuel Pool Pump Room and Mix Tank area	310	Passage	4.2.4	A,R,E	A,R,E		R*,'R1,E1	R*: Cable Tray Systems (see notes below) R1: Combustible Free Zone located on hatch covers E1: Combustible Free Zone located on hatch covers.
U-01	Spent Fuel Pool Pump Room and Mix Tank area	312	Spent Fuel Pump Room	4.2.4	A,R			R*	R*: Cable Tray Systems (see notes below)
U-01	Spent Fuel Pool Pump Room and Mix Tank area	313	Hatch Area	4.2.4	A,R,E	A,R,E		R*	R*: Cable Tray Systems (see notes below)
UU-01	Auxiliary and Turbine Bldg. Stairwell and Elevator Rooms	327	Turbine Building Elevator Machine Room	4.2.4					
UU-01	Auxiliary and Turbine Bldg. Stairwell and Elevator Rooms	329	Vestibule	4.2.4					

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
UU-01	Auxiliary and Turbine Bldg. Stairwell and Elevator Rooms	AB-1	Aux. Building Stairwell	4.2.4	A				
UU-01	Auxiliary and Turbine Bldg. Stairwell and Elevator Rooms	EL2	Aux. Building Elevator	4.2.4					
V-01	Spent Fuel Pool Area	222	Fuel Transfer Tube Room	4.2.4					
V-01	Spent Fuel Pool Area	223	Cask Pit	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	224	Spent Fuel Storage Pool	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	300	Fuel Handling Area	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	300A	Cask Wash Area	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
V-01	Spent Fuel Pool Area	300B	Drum Storage	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	301	Solid Waste Baler Area	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	302	Drumming Station	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	304	Corridor	4.2.4	A,R,E	A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	305	Decontamination Area	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	306	New Fuel Storage	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
V-01	Spent Fuel Pool Area	400	Passage	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	401	Fuel Handling Exhaust Unit Room	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	404	Corridor	4.2.4	A,R,E			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	405	Storage	4.2.4	A,R	A,R,E		R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	406	Hot Instrument Shop	4.2.4	A,R			R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete
V-01	Spent Fuel Pool Area	TT	Transfer Tubes	4.2.4				R*,R1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments
VA-01	Auxiliary Building Stairwell, AB-3A	AB-3A	Aux. Building Stairwell	4.2.4					
X-01	Low Voltage Switchgear-F bus and No. 1 Electrical Isolation Rooms	428	Low Voltage Switchgear Room F Bus	4.2.4	A,R,L,E			R*,R1,E1, E2,L1	R*: Cable Tray Systems (see notes below) R1: Conduit embedded in concrete E1: Structural Steel Fireproofing E2: Gypsum board under hatch L1: Conduit embedded in concrete
X-01	Low Voltage Switchgear-F bus and No. 1 Electrical Isolation Rooms	428B	Number 1 Electrical Isolation Room	4.2.4				R*	R*: Cable Tray Systems (see notes below)
X-02	Battery Room B	428A	Battery Room B	4.2.4	A				
Y-01	Low Voltage Switchgear-E bus and No. 2 Electrical Isolation Rooms	429	Low Voltage Switchgear Room E Bus	4.2.4	A,R			R*	R*: Cable Tray Systems (see notes below)
Y-01	Low Voltage Switchgear-E bus and No. 2 Electrical Isolation Rooms	429A	Number 2 Electrical Isolation Room	4.2.4				R*	R*: Cable Tray Systems (see notes below)
Y-02	Battery Room A	429B	Battery Room A	4.2.4	A				

Table 4-3 Summary of NFPA 805 Compliance Basis and Required Fire Protection Systems and Features

DBNPS Fire Compartment	Compartment Name	Room	Room Description	NFPA 805 Regulatory Basis	Auto Detection	Auto Suppression	ERFBS	Other	Comments

General Notes:

1. Auto Suppression is defined as water based fire suppression systems that activates from heat or smoke. The devices that actuate these systems by detecting the fire are governed by the suppression system installation. Where installed, these same devices typically send a signal to the central supervisory location. [i.e. MCR and local panels].
2. Auto Detection is defined as installed fire detectors used for area or hazard early warning notification and typically not part of a suppression system actuation circuit. These circuits are installed in accordance with NFPA 72 and typically only provide annunciation to a central supervisory point [i.e., MCR and local panels].
3. Required fire protection features [i.e., Auto Detection, Auto Suppression, ERFBS, and Other] are determined by the results from the NFPA 805, Chapter 4 Fire Compartment FREs.

Abbreviations:

A - Feature located in the area but no credit taken for it in risk reduction

D - Defense-in-Depth Criteria: Systems that are installed and required to maintain adequate balance of Defense-in-Depth for a Performance-Based Approach

E - EEEE: Installed features or elements credited in "adequate for the hazard" or “equivalent” Existing Engineering Equivalency Evaluations

L - Installed and Credited in approved NRC Licensing Exemptions or prior NRC Licensing Approval (i.e., Exemptions/Deviations)

R - Risk Criteria: Systems that are installed and required to meet the Risk Criteria for the Performance-Based Approach

R* - Risk Criteria: Cable tray systems that are protected on three (3) sides by metal covers and on top by ceramic fiber [e.g. Kaowool].

S - Separation Criteria: Systems that are installed and required for Chapter 4 Separation Criteria

5.0 REGULATORY EVALUATION

5.1 Introduction – 10 CFR 50.48

On July 16, 2004, the NRC amended 10 CFR 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, 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 DBNPS 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 FR Notice 69 FR 33536 dated June 16, 2004, ML041340086).

NFPA 805 does not supersede the requirements of GDC 3, 10 CFR 50.48(a), or 10 CFR 50.48(f). Those regulatory requirements continue to apply to licensees that adopt NFPA 805. However, under NFPA 805, the means by which GDC 3 or 10 CFR 50.48(a) requirements may be met is different than under 10 CFR 50.48(b). Specifically, whereas GDC 3 refers to SSCs important to safety, NFPA 805 identifies fire protection systems and features required to meet the Chapter 1 performance criteria through the methodology in Chapter 4 of NFPA 805. Also, under NFPA 805, the 10 CFR 50.48(a)(2)(iii) requirement to limit fire damage to SSCs important to safety so that the capability to safely shut down the plant is ensured is satisfied by meeting the performance criteria in Section 1.5.1 of NFPA 805. The Section 1.5.1 criteria include provisions for ensuring that reactivity control, inventory and pressure control, decay heat removal, vital auxiliaries, and process monitoring are achieved and maintained.

This methodology specifies a process to identify the fire protection systems and features required to achieve the nuclear safety performance criteria in Section 1.5 of NFPA 805. Once a determination has been made that a fire protection system or feature is required to achieve the performance criteria of Section 1.5, its design and qualification must meet any applicable requirements of NFPA 805, Chapter 3. Having identified the required fire protection systems and features, the licensee selects either a deterministic or performance-based approach to demonstrate that the performance criteria are satisfied. This process satisfies the GDC 3 requirement to design and locate SSCs important to safety to minimize the probability and effects of fires and explosions. (Reference FR Notice 69 FR 33536 dated June 16, 2004, ML041340086)

The new rule provides actions that may be taken to establish compliance with 10 CFR 50.48(a), which requires each operating nuclear power plant to have a fire protection program plan that satisfies GDC 3, as well as specific requirements in that section. The transition process described in 10 CFR 50.48(c)(3)(ii) provides, in pertinent parts, that a licensee intending to adopt the new rule must, among other things, “modify the fire protection plan required by paragraph (a) of that section to reflect the licensee’s decision to comply with NFPA 805.” Therefore, to the extent that the contents of the existing fire protection program plan required by 10 CFR 50.48(a) are inconsistent with NFPA 805, the fire protection program plan must be modified to achieve compliance with the requirements in NFPA 805. All other requirements of 10 CFR 50.48(a) and GDC 3 have corresponding requirements in NFPA 805.

A comparison of the current requirements in Appendix R with the comparable requirements in Section 3 of NFPA 805 shows that the two sets of requirements are consistent in many respects. This was further clarified in FAQ 07-0032, 10 CFR 50.48(a), and GDC 3 clarification (ML081400292). The following tables provide a cross-reference of fire protection regulations associated with the post-transition DBNPS fire protection program and applicable industry and DBNPS 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 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 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 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 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 NEI 04-02, Table B-1
(ii) Automatic and manually operated fire detection and suppression systems; and	NFPA 805, Sections 3.5 through 3.10 and Chapter 4 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, Section 3.3 and Chapter 4 NEI 04-02, B-3 Table

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

10 CFR 50.48(a) Section(s)	Applicability/Compliance Reference
(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. NG-DB-00302, “DBNPS Fire Protection Program” and NOP-LP-4003, “Evaluation of Changes, Tests and Experiments” procedures provide direction for retention of records to the fire protection plan.
(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. DBNPS is licensed under 10 CFR 50.

General Design Criterion 3

Table 5-2 GDC 3 – Applicability/Compliance Reference

GDC 3, Fire Protection, Statement	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.	NFPA 805, Chapters 3 and 4 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.	NFPA 805, Sections 3.3.2, 3.3.3, 3.3.4, 3.11.4 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.	NFPA 805, Chapters 3 and 4 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	NFPA 805, Sections 3.4 through 3.10 and 4.2.1 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 used.
(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 used.
(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 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 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 pilot-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 SSD methodology.
(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.
(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 compliance with a flame propagation test is being submitted for NRC approval and is documented in Attachment L.
(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.	DBNPS "Complies by Previous NRC Approval." See 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 use of performance-based methods for NFPA 805, Chapter 3 is requested. See Attachment L.
(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 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 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: (i) Satisfy the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release; (ii) Maintain safety margins; and (iii) Maintain fire protection defense-in-depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe shutdown capability).	No risk-informed or performance-based alternatives to compliance with NFPA 805 (per 10 CFR 50.48(c)(4)) were utilized. See Attachment P.

5.2 Regulatory Topics

5.2.1 License Condition Changes

The current DBNPS fire protection license condition 2.C(4) is being replaced with the standard license condition in Regulatory Position 3.1 of RG 1.205, as shown in Attachment M.

5.2.2 Technical Specifications

A review of the DBNPS Technical Specifications was performed to determine which Technical Specifications are required to be revised, deleted, or superseded. It was determined that the changes to the Technical Specifications and applicable justification listed in Attachment N are adequate for the DBNPS adoption of the new fire protection licensing basis.

5.2.3 Orders and Exemptions

A review of the DBNPS docketed correspondence was performed 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

A written evaluation of the significant hazards consideration of a proposed license amendment is required by 10 CFR 50.92. According to 10 CFR 50.92, a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

- Involve a significant increase in the probability or consequences of an accident previously evaluated; or

- Create the possibility of a new or different kind of accident from any accident previously evaluated; or
- Involve a significant reduction in a margin of safety.

This evaluation is contained in Attachment Q.

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. DBNPS has evaluated the proposed amendment and determined that it involves no significant hazards consideration.

5.3.2 Environmental Consideration

Pursuant to 10 CFR 51.22(b), an evaluation of the LAR has been performed to determine whether it meets the criteria for categorical exclusion set forth in 10 CFR 51.22(c). That evaluation is discussed in Attachment R. The evaluation confirms that this LAR meets the criteria set forth in 10 CFR 51.22(c)(9) for categorical exclusion from the need for an environmental impact assessment or statement.

5.4 Revision to the UFSAR

After the approval of the LAR, in accordance with 10 CFR 50.71(e), the DBNPS UFSAR will be revised. The format and content will be consistent with NEI 04-02, FAQ 12-0062.

5.5 Transition Implementation Schedule

The following schedule for transitioning DBNPS to the new fire protection licensing basis requires NRC approval of the LAR in accordance with the following schedule:

- Implementation of new NFPA 805 fire protection program to include procedure changes, process updates, and training to affected plant personnel. This will occur 180 days following the issuance of an approved SER from the NRC unless that date falls within a scheduled refueling outage. Then, implementation will occur 60 days after startup from that scheduled refueling outage. See Attachment S, Table S-2.
- Attachment S, Table S-1 provide a listing of plant modifications associated with the transition to NFPA 805. Modifications will be completed by the startup of the first refueling outage after the issuance of the SER. Appropriate compensatory measures will be maintained until modifications are complete.

6.0 REFERENCES

The following references were used in the development of the TR. Additional references are in the NEI 04-02 Tables in the various Attachments.

Federal Regulations and NRC Guidance:

1) 10 CFR Part 50.48, "Fire Protection."

2) "Fire Protection Program - Post-Fire Operator Manual Actions," March 6, 2006, Federal Register, Vol. 71, No. 43, pp. 11169-11172.

3) Generic Letter 2006-03, April 10, 2006, "Potentially Nonconforming Hemyc and MT Fire Barrier Configurations."

4) NFPA 805, 2001 Edition, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants."

5) NRC letter to NEI (ML061660105), July 12, 2006, "Process for Frequently Asked Questions for Title 10 of the Code of Federal Regulations, Part 50.48(c) Transitions."

6) "NRC Enforcement Policy," June 16, 2004, Federal Register, Vol. 69, No. 115, pp. 33684-33685.

7) "NRC Enforcement Policy: Extension of Discretion Period of Interim Enforcement Policy," April 18, 2006, Federal Register, Vol. 71, No. 74, pp. 19905-19907.

8) "NRC Enforcement Policy; Extension of Enforcement Discretion of Interim Policy," January 14, 2005, Federal Register, Vol. 70, No. 10, pp. 2662-2664.

9) NUREG/CR-6850, September 2005, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities."

10) RG 1.205, Revision 1, December 2009, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants."

11) RIS 2007-19, August 20, 2007, "Process For Communicating Clarifications of Staff Positions Provided in Regulatory Guide 1.205 Concerning Issues Identified During the Pilot Application of National Fire Protection Association Standard 805."

NEI and Industry Guidance and Standards:

12) ANSI/ANS-58.23-2007, November 20, 2007, "American National Standard - Fire PRA Methodology."

13) ASME/ANS-RA-S-2007, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Application, Combined PRA Standard."

14) ASME RA-S-2002, "Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications" (and 2007 addenda ASME RA-Sc-2007, Appendix A).

15) NEI 00-01, Revision 1, January 2005, "Guidance for Post-Fire Safe Shutdown Circuit Analysis."

16) NEI 00-02, Revision 1, May 2006, "Probabilistic Risk Assessment (PRA) Peer Review Process Guidance."

17) NEI 04-02, Revision 2, April 2008, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program under 10 CFR 50.48(c)."

18) “Nuclear Mutual Limited (NML) Property Loss Prevention Standards for Nuclear Generating Stations."

19) NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management."

20) NUMARC 93-01, Revision 3, July 2000, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

Davis-Besse Reports

21) 600860555, “R1957-0511-0001, Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA.”

22) ARS-DB-10-004, “Transition of Fire Protection Program Design Elements Review.”

23) ARS-DB-11-003, “Davis-Besse Non-Power Operational Modes Transition Report.”

24) ARS-DB-11-007, “Nuclear Safety Capability Assessment Methodology Review (Table B-2).”

25) ARS-DB-11-008, “Existing Licensing Action Transition.”

26) ARS-DB-11-015, “Task 1.2 - Chapter 3 Fire Area Specific Fire Protection Features Review.”

27) ARS-DB-12-029, “Review of Existing Engineering Equivalency Evaluations Report.”

28) ARS-DB-12-030, “Radiological Release Transition Review.”

29) ARS-DB-12-031, “Task 2.3, Nuclear Safety Performance Criteria (Fire Area) Report.”

30) ARS-DB-13-069, “Davis-Besse LAR TR Sections 1-3.”

31) ARS-DB-13-072, “Transition Report Attachment I - Power Block.”

32) ARS-DB-13-073, “Transition Report Sections 4.6 and 6.0.”

33) ARS-DB-13-075, “Transition Report Attachment H – NFPA 805 FAQ Summary Table.”

34) ARS-DB-13-076, “Transition Report Sections 5.1-5.3 and Attachments M, N, O, Q, and R.”

35) ARS-DB-13-077, “Transition Report Section 4.7.”

36) ARS-DB-13-078, “Review of Recovery Actions for LAR Attachment G.”

37) ARS-DB-13-079, “NFPA 805 LAR Table 4-3 Report.”

38) ARS-DB-13-080, “Transition Report Attachment L - NFPA 805 Chapter 3 Requirements for Approval, Attachment T – Clarification of Prior NRC Approvals, and TR Sections 4.1.2.2, 4.1.2.3, 4.2.1.2, and 4.2.1.4.”

39) ARS-DB-13-081, “Att. S Modifications and Items to be Completed During Implementation.”

40) PRA Notebook 01-01: “PRA Roadmap & Peer Reviews.”

41) PRA Notebook 10-01: “Fire PRA Components Selection.”

42) PRA Notebook 10-05: “Fire Risk Quantification.”

43) PRA-DB1-13-028-R00, “Cumulative CDF and LERF from VFDRs.”

ATTACHMENTS

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

688 Pages Attached

Davis-Besse Nuclear Power Station, Attachment A1 Records

143 Pages Attached

Transition Report Attachment

Davis-Besse

A - NEI 04-02 Table B-1 Transition of Fundamental FP Program Requirements and Design Elements

Transition Report Section: **- Attachments**

Transition Report Subsection: **A - NEI 04-02 Table B-1 Transition of Fundamental FP Program Requirements and Design Elements**

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Non-Fire Compartment Specific
Transition Report

Davis-Besse

3.1 General

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - N/A

None

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.

Compliance Basis:

The Davis Besse compliance with the fire protection elements and minimum design requirements presented in NFPA 805 Chapter 3 is not based on performance methods permitted elsewhere in the standard. The following discussion of Chapter 3 requirements documents Davis Besse compliance or intended compliance with the individual code sections. In addition, documentation is provided where previous NRC approval has been granted for a deviation to the code.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

-None

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.2 Fire Protection Plan

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Davis-Besse has a site-wide Fire Protection Program with management policy and program direction documented in administrative procedures. These procedures also define the specific requirements and responsibilities of those individuals responsible for the administration and implementation of the Fire Protection Program.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"

Open Items and VFDRs

-None

3.2 Fire Protection Plan

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Davis-Besse utilizes an administrative procedure document that establishes the general policy direction for the site Fire Protection Program. This procedure also defines the management authority and responsibilities for the positions within the site Fire Protection Program.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.2.2.1

The policy document shall designate the senior management position with immediate authority and responsibility for the fire protection program.

Compliance Basis:

The administrative procedure document designates the site Vice President - Nuclear as the senior management position with immediate authority and responsibility for the fire protection program.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

The administrative procedure document designates the site Fire Marshal as the individual responsible for the daily administration and coordination of the Fire Protection Program and its implementation.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

The administrative procedure document establishes the site Fire Marshal as inter-departmental liaison for all Fire Protection related systems and issues. This document identifies the various plant positions having the authority for implementing the various areas of the Fire Protection Program, and assigns responsibilities for the coordination of activities. This document also defines the fire protection interfaces with other organizations.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Will Comply with the Use of Commitment

3.2.2.4

The policy document shall identify the appropriate AHJ for the various areas of the fire protection program.

Compliance Basis:

The station procedures which define the responsibilities and requirements for the site fire protection program will be revised to indicate that, for the purposes of satisfying the nuclear safety requirements of NFPA 805, the NRC is the AHJ.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"
- NOP-CC-2004, Rev. 10, "Design Interface"

Open Items and VFDRs

Item Number DB-0779 **Item Title:** 3.2.2.4 – Revise NG-00302 to List NRC as AHJ

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - N/A

3.2.3

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:

Compliance Basis:

This is a general statement section. Refer to the following subsections for the specific NFPA 805 subsection requirements and the compliance statement for each.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

3.2.3(1)

Inspection, testing, and maintenance for fire protection systems and features credited by the fire protection program

Compliance Basis:

Complies

Davis-Besse procedures include inspection, testing, and maintenance for fire protection systems and features credited by the fire protection program.

Will Comply with use of Commitment

A comprehensive review of fire protection features credited by the fire protection program under NFPA 805 will be conducted to ensure that these features are included in procedures. This activity is being tracked by LAR Attachment S, Open Item DB-0573

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- NOP-LP-2018, Rev. 11, "Quality Control Inspection of Maintenance and Modification Activities"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04021, Rev. 7, "Periodic Test Procedure Appendix R Fire Wrap Visual Inspection"
- DB-FP-04017, Rev. 8, "18 Month RRA Deluge Sprinkler Functional Test"
- NOP-WM-4006, Rev. 7, "Conduct of Maintenance"

Open Items and VFDRs

Item Number DB-0573 **Item Title:** 3.2.3(1) – Review Performance-Based Inspection Requirements to include NFPA 805 credited fire protection equipment

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

3.2.3(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

Compliance Basis:

Complies

Davis-Besse procedures include compensatory actions and limits on impairment duration for when fire protection systems cannot perform their intended function.

Will Comply with use of Commitment

A comprehensive review of the revised safe shutdown component list and features credited by the fire protection program under NFPA 805 will be conducted to verify that appropriate compensatory actions exist per open item DB-0572 in LAR Attachment S.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"
- DB-FP-00009, Rev. 20, "Fire Protection Impairment and Fire Watch"

Open Items and VFDRs

Item Number	DB-0572	**Item Title:** 3.2.3(2) – Procedures revised to include credited NFPA 805 fire protection equipment and compensatory measures

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Non-Fire Compartment Specific
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.2.3(3)

Reviews of fire protection program - related performance and trends

Compliance Basis:

Davis-Besse procedures include reviews of fire protection program-related performance and trending.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"
- NOBP-ER-3003, Rev. 6, "FENOC System Performance Monitoring Program"
- NOBP-ER-3009, Rev. 11, "FENOC Plant Health Report Program"
- FENOCQAPM, Rev. 19, "Quality Assurance Program Manual"
- NOP-ER-2101, Rev. 08, "Engineering Program Management"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.2.3(4)

Reviews of physical plant modifications and procedure changes for impact on the fire protection program

Compliance Basis:

Davis-Besse uses procedures to review physical plant modifications and procedure changes for impact on the fire protection program.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- EN-DP-01140, Rev. 3, "Fire Hazard Analysis"
- NOPM-CC-6000, Rev. 4, "Prob. Risk Assessment Program"
- NOP-CC-2004, Rev. 10, "Design Interface"
- NOBP-CC-6001, Rev. 6, "Prob. Risk Assessment Model Management"
- NOP-SS-3001, Rev. 20, "Procedure Review and Approval"
- NOBP-CC-6002, Rev. 3, "Prob. Risk Assessment Applications Management"
- NG-DB-00302, Rev. 9, "Fire Protection Program"
- NOP-LP-4003, Rev. 7, "Evaluations of Changes,Tests and Experiments"
- NOP-CC-2003, Rev. 20, "Engineering Changes"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.2.3(5)

Long-term maintenance and configuration of the fire protection program

Compliance Basis:

Davis-Besse uses procedures to ensure long-term maintenance and configuration of the fire protection program.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- EN-DP-01140, Rev. 3, "Fire Hazard Analysis"
- NG-DB-00302, Rev. 9, "Fire Protection Program"
- NOBP-CC-6002, Rev. 4, "Prob. Risk Assessment Applications Management"
- NOP-SS-3001, Rev. 20, "Procedure Review and Approval"
- NOPM-CC-6000, Rev. 4, "Prob. Risk Assessment Program"
- NOBP-CC-6001, Rev. 6, "Prob. Risk Assessment Model Management"
- NOP-CC-2003, Rev. 20, "Engineering Changes"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.2.3(6)

Emergency response procedures for the plant industrial fire brigade

Compliance Basis:

Emergency response procedures are provided for the plant industrial Fire Brigade.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

-None

3.3 Prevention

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3

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 control that restrict the use of combustible materials

Compliance Basis:

As part of the Fire Protection Program at Davis-Besse, a fire prevention program with the goal of preventing a fire from starting has been established, documented, and implemented. Through site administrative procedures and nuclear operating procedures, the basic components of the program consist of preventing fires and fire spread by controls on operational activities, and design controls that restrict the use of combustible materials.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"
- DB-FP-00018, Rev. 12, "Control of Ignition Sources"
- NOP-CC-2003, Rev. 20, "Engineering Changes"
- NOP-CC-2004, Rev. 10, "Design Interface"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

-None

3.3 Prevention

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.1

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.

Compliance Basis:

The fire prevention program activities at Davis-Besse 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. Procedures for hot work fire watch measures and controls of transient combustibles, including documentation requirements, provide an emphasis 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.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00018, Rev. 12, "Control of Ignition Sources"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - N/A

3.3.1.1

3.3.1.1 General Fire Prevention Activities. The fire prevention activities shall include but not be limited to the following program elements:

Compliance Basis:

This is a general introductory statement section. Refer to the following subsections for the specific NFPA 805 requirements.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Non-Fire Compartment Specific
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.1.1(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

Compliance Basis:

Davis-Besse requires compliance with nuclear operating administrative procedures and requires training courses on fire safety information for all employees and contractors. This includes familiarization with plant fire prevention procedures, fire reporting, and plant emergency alarms.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NOP-LP-1001, Rev. 15, "Unescorted Access Requirements"
- FEN-PAT, Rev. 10, "Plant Access Training"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Will Comply with the Use of Commitment

3.3.1.1(2)

Documented plant inspections including provisions for corrective actions for conditions where unanalyzed fire hazards are identified

Compliance Basis:

Procedures will be modified to require documentation of the Fire Marshall/designee inspections performance in accordance with fire inspection procedures, including documentation of corrective actions for unanalyzed fire conditions as appropriate. This item is being tracked in LAR Attachment S open item DB-0600.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"
- FENOCQAPM, Rev. 19, "Quality Assurance Program Manual"
- NOP-OP-1012, Rev. 7, "Material Readiness and Housekeeping Inspection Program"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

Item Number DB-0600 **Item Title:** 3.3.1.1(2) – Create Documentation Requirement for NG-DB-00302

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.1.1(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.

Compliance Basis:

Davis-Besse uses administrative controls documented in procedures to address 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.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"
- NOP-CC-2003, Rev. 20, "Engineering Changes"
- NOP-CC-2004, Rev. 10, "Design Interface"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - N/A

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:

Compliance Basis:

This is a general introductory statement section. Refer to the following subsections for the specific NFPA 805 requirements.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NOP-OP-1012, Rev. 7, "Material Readiness and Housekeeping Inspection Program"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

Item Number DB-0525 **Item Title:** See Attachment S: DB-FP-00007 Requires Revision to Clarify the Combustible and Transient Loading Program Requirements

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

3.3.1.2(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.

Compliance Basis:

Complies

Davis-Besse procedures require all wood used for scaffold or construction purposes in areas to be treated with flame retardant application. Painting of pallets, cribbing, and other minor uses of wood for shipping and receiving, as well as incidental uses of wood, such as mops, is not required.

Will Comply with use of Commitment

Procedures will be reviewed to ensure that these requirements are specified for all the areas defined as the "power block." This activity is being tracked by LAR Attachment S, Open Item DB-0525.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"
- DB-MS-01637, Rev. 15, "Scaffold Erection and Removal"

Open Items and VFDRs

Item Number DB-0525 **Item Title:** See Attachment S: DB-FP-00007 Requires Revision to Clarify the Combustible and Transient Loading Program Requirements

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Will Comply with the Use of Commitment

3.3.1.2(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.

Compliance Basis:

Complies

Davis-Besse Administrative Procedure DB-FP-00007, Control of Transient Combustibles, establishes requirements, administrative controls and guidelines for handling, storage and use of transient combustibles and flammable materials. The procedure is applicable to all station employees and contractors. Section 6.1.12 states all plastic sheeting (Herculite, Visqueen, etc.) shall be flame retardant.

Will Comply with the Use of Commitment

Davis-Besse procedures will be revised to require plastic sheeting that meets NFPA 701 or equivalent. Procedures will be reviewed to ensure that these requirements are specified for all the areas defined as the "power block." This action will be tracked in LAR Attachment S open item DB-0525.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

Item Number	DB-0525	**Item Title:** See Attachment S: DB-FP-00007 Requires Revision to Clarify the Combustible and Transient Loading Program Requirements

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Will Comply with the Use of Commitment

3.3.1.2(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.

Compliance Basis:

Complies

Site administrative procedures require waste, debris, scrap, rags, or other combustibles to be removed from an area immediately following the completion of the work activity, or at the end of each work shift, whichever comes first.

Will Comply with the Use of Commitment

Procedure DB-FP-00007, Section 2.1.1 will be revised to include all areas within the power block as required by NFPA 805. This activity is being tracked by LAR Attachment S, Open Item DB-0525.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

Item Number	DB-0525	**Item Title:** See Attachment S: DB-FP-00007 Requires Revision to Clarify the Combustible and Transient Loading Program Requirements

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Will Comply with the Use of Commitment

3.3.1.2(4)

Combustible storage or staging areas shall be designated, and limits shall be established on the types and quantities of stored materials.

Compliance Basis:

Complies

Davis-Besse procedures limit the types, quantities, and locations of stored materials, including combustibles.

Will Comply with use of Commitment

Davis-Besse procedures will be modified as necessary during the NFPA 805 transition period to ensure that the transient combustible loads in specific fire compartments are within the quantity and duration limiting values as assumed in the associated fire compartment Detailed Fire Models and Probabilistic Risk Assessment evaluations. This activity is being tracked by LAR Attachment S, Open Item DB-1058. Procedure DB-FP-00007, Section 2.1.1 will be revised to include all areas within the power block as required by NFPA 805. This activity is being tracked by LAR Attachment S, Open Item DB-0525.

Licensing Actions
- None

Supporting EEEEs
- No Evaluations

References
- C-FP-013.10-006, Rev. 4, "Combustible Loading Analysis"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"
- EN-DP-01140, Rev. 3, "Fire Hazard Analysis"

Open Items and VFDRs

Item Number	DB-0525	**Item Title:** See Attachment S: DB-FP-00007 Requires Revision to Clarify the Combustible and Transient Loading Program Requirements
Item Number	DB-1058	**Item Title:** Task 1.1; Procedure Revision, DB-FP-0007, Control of Combustibles to Include Duration Limits Based on Fire Modeling

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Complies by Previous NRC Approval

3.3.1.2(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.

Compliance Basis:

Complies

Davis-Besse procedures provide the requirements for handling flammable liquids, which incorporates the requirements of NFPA 30. A NFPA 30-1973 code review determined that Davis-Besse is in compliance except for 9 areas of non-compliance as documented in Serial Report No. 1685 Attachment 15 dated July 31, 1989.

The non-compliances with NFPA 30 have been resolved through NRC previous approval.

Complies by Previous NRC Approval

The NRC acceptance of the DBNPS NFPA 30 code review and non-compliances is documented in Log No. 3480, “NRC Safety Evaluation of Fire Protection...” (ML033490026), dated May 30, 1991, is as follows:

"Consequently, the licensee provided supplemental information which explicitly identified deviations from staff fire protection guidelines and the relevant National Fire Protection Association (NFPA) Standards and provided justification as to why these deviations were not safety significant. The staff considers these deviations to fall within two categories. The first are those deviations which represent minor variances. These minor variances and those features of the Davis-Besse Fire Protection Program which conform with NRC and NFPA criteria are described comprehensively in the documents cited above and are not discussed in detail this safety evaluation since the staff finds that the minor deviations are acceptable. The second category are those deviations which are not considered by the staff to be minor variances and for which there was, initially some concern on the part of the staff regarding the licensees justification of its technical approach. The staff's basis for accepting these latter deviations is contained in the following evaluation.”

"Finally, in its comparison of the fire protection program with the criteria of NFPA Standard No. 30, the licensee identified a deviation in its letter dated July 31, 1989 pertaining to the quantity of flammable and combustible liquids located outside of any storage area. To evaluate this issue, the staff reviewed Administrative Procedure DB-FP-00007 (Revision 00) which covers the control of transient combustibles. The procedure limits quantities of flammable and combustible liquids as well as other combustible materials to that necessary for plant operations. When excess quantities are present in an area, prior approval per the procedure is necessary and, in certain configurations, additional compensatory fire protection measures are taken. The staff concludes that the subject procedure and the noted deviation from NFPA Standard No. 30 are acceptable."

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.1.2(6)

Controls on use and storage of flammable gases shall be in accordance with applicable NFPA standards.

Compliance Basis:

Storage of flammable gas cylinders is located outdoors, or in separate detached buildings. Davis-Besse complies with hydrogen storage requirements per NFPA 50A.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- DB-OP-06033, Rev. 14, "Hydrogen Addition and Degassification"
- DB-OP-06210, Rev. 17, "CO2 & Hydrogen System"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Davis-Besse administratively controls hot work safety in accordance with the requirements of NFPA 51B-1971 and NFPA 51-1974 as applicable to cutting and welding processes at the plant. Compliance with NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, sections which are applicable to hot work are met through required fire watches and compliance with NFPA 51B and NFPA 51, as stated in NFPA 241 section 5.1.1 and 5.1.2. NFPA 241 was added as a reference to applicable procedures.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- NOBP-CC-7001, Rev. 20, "Procurement Packages"
- NORM-CC-7001, Rev. 1, "Procurement Standard Clauses"
- DB-FP-00018, Rev. 12, "Control of Ignition Sources"
- NOP-CC-7002, Rev. 13, "Procurement Engineering"
- DB-FP-00009, Rev. 20, "Fire Protection Impairment and Fire Watch"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Site administrative procedures restrict smoking and other possible sources of ignition to properly designated and supervised safe areas of the plant.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00018, Rev. 12, "Control of Ignition Sources"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.1.3.3

Open flames or combustion-generated smoke shall not be permitted for leak or air flow testing.

Compliance Basis:

Site administrative procedures prohibit open flames or combustion-generated smoke from being used for leak or air flow testing.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00018, Rev. 12, "Control of Ignition Sources"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.1.3.4

Plant administrative procedure shall control the use of portable electric 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.

Compliance Basis:

Davis-Besse administrative procedures include guidance on the use of electric heaters and prohibition of the use of fuel fired heaters in safety related areas, indoor areas, and anywhere there is a potential for radiological releases resulting from a fire.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00018, Rev. 12, "Control of Ignition Sources"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

The walls, floors, and components required to maintain structural integrity consist of poured concrete, concrete masonry units, or structural steel. These materials will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat, meeting the definition of noncombustible construction in NFPA 220.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Will Comply with the Use of Commitment

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.

Compliance Basis:

Complies

Davis-Besse complies with the requirements of BTP APCSB 9.5-1 and NFPA 805 for interior finishes flame spread, smoke and fuel contribution per Coatings Specification A-024N-09-06.

Will Comply with the Use of Commitment

Davis-Besse will comply with the commitment to revise Coatings Specification A-024N to meet Class A interior finish requirements for critical radiant heat flux of not less than 0.45 W/cm^2, This is being tracked in LAR Attachment S open Item DB-1810.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- A-024N, Rev. 9, "Specification for Field Coating Outside Containment for the Davis-Besse Nuclear Power Station"
- BTP APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants"
- Specification A-001, Section B-22, Rev. 16, "Ceiling Tile"
- A-024N-09-06, Rev. 9, "Specification Change Notice to Notification 600655522"

Open Items and VFDRs

Item Number DB-1810 **Item Title:** Revise Interior Finish procurement specifications to include Radiant Heat Flux

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Complies by Previous NRC Approval

3.3.4

Thermal insulation materials, radiation shielding materials, ventilation duct materials, and soundproofing materials shall be noncombustible or limited combustible.

Compliance Basis:

Complies

The FHAR requires that interior wall and structural components, thermal insulation materials and radiation shielding materials and sound proofing should be non-combustible:

"...Non combustibles were used for wall, structural components, and radiation shielding. Non combustible metal reflective thermal insulation is used inside containment. In other areas, regular pipe insulation is non combustible calcium silicate."

Complies by Previous Approval

A deviation was submitted to account for insulation material smoke and fuel contribution rating that exceeds the listed standard and was accepted by NRC staff.

The NRC previous approval excerpt from Log 3480, dated May 30, 1991 (ML033490026), is as follows:

"Staff guidelines stipulate that insulation material should have a flame spread, smoke and fuel contribution rating of 25 or less as determined by the test method of ASTM E-84. As indicated by the licensee in its letter dated January 6, 1988, the insulation meets the flame spread rating but exceeds the smoke and fuel contribution rating. However the staff concludes that the degree of deviation is insignificant from a safety standpoint based on the relatively limited quantity of insulation compared to other in-situ combustible materials and the active and passive fire protection features that comprise the defense in depth philosophy of fire protection at the plant."

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

- SD-028B, Rev. 4, "Auxiliary Building Nonradioactive Areas Heating and Ventilation System"

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies by Previous NRC Approval
- Submit for NRC Approval
- Will Comply with the Use of Commitment

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.

Compliance Basis:

Complies by Previous Approval

NRC Safety Evaluation dated May, 30, 1991 (ML033490026) states: “Finally, the licensee stated that cables are run above the ceiling in the control room and that this concealed space is not protected by a halon fire suppression system as recommended in Appendix A to the BTP. Because the cables are installed in conduit and exist in limited quantities, the staff concludes that they pose no significant fire hazard. Therefore, the staff concludes that the lack of a fixed fire suppression system for these cables is acceptable.”

Submit for NRC Approval

Acceptance of low voltage, non-enclosed or non-plenum rated wiring above suspended ceilings in Fire Compartment CC-01 is included in LAR Attachment L for NRC approval.

Will Comply with the Use of Commitment

Open Item DB-1964 calls for cable installation specification revisions to ensure future compliance. Open Item DB-2020 documents the commitment to resolve the non-enclosed power wiring above suspended ceilings for emergency lighting in Fire Compartment CC-01. Both items are included in Attachment S.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- WP-029, Rev. 2, "Electrical Wiring Located Above Suspended Ceilings for Approval - Discussion for LAR Attchment L"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Open Items and VFDRs

Item Number	DB-1964	**Item Title:** Revise Cable Specifications
Item Number	DB-2002	**Item Title:** Electrical Wiring Located Above Suspended Ceilings for Approval

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Davis-Besse specifications ensure that only metal tray and metal conduits are used for electrical raceways. Thin wall metallic tubing is only used for lighting circuits, and is not used for power, instrumentation, or control cables. Flexible metallic conduits are only used in short lengths to connect components.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- 3614-2-E-14Q, Rev. 0, "Nuclear Engineering and Const. Spec."
- DB-ME-09512, Rev. 6, "Installation Procedure for Raceways Carrying Electrical Cables"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies by Previous NRC Approval
- Submit for NRC Approval
- Will Comply with the Use of Commitment

3.3.5.3

Electric cable construction shall comply with a flame propagation test as acceptable to the AHJ.

Compliance Basis:

Complies by Previous Approval

Davis-Besse fire tests were conducted prior to the establishment of the current IEEE 383 flame test standard. Log No. 3480 (ML033490026) reviewed the fire barrier penetration flame tests and limited use of jacketed PVC cable at Davis Besse against the guidelines in Appendix A to BTP APCSB 9.5-1 and found them acceptable. The letter states: "The licensee indicated that fire tests used to qualify electric cable initially installed in the plant did not conform with the methodology required by IEEE Standard No. 383; rather, an alternative methodology was used. However, based on the levels of fire protection (e.g., fire detection, fire suppression and fire barriers) provided for safe shutdown systems and hazardous areas as described in the FAOR, Revision 1 and subsequently in Revision 12 of the FHAR, the staff concludes that this deviation is acceptable." The fire test flame source used to qualify the Davis Besse electric cables done was incorporated into IEEE 383-1974 Section 2.5.4.5 as an acceptable alternative flame source. In addition, the letter states: “The licensee indicated that some exposed polyvinyl chloride (PVC) jacketed cables are used in the plant in limited quantities in computers and electronic cabinets. The staff does not consider PVC cables enclosed in conduits to be a significant hazard. Because the quantity of exposed PVC cables is minimal, the staff also concludes that no appreciable hazard exists in the plant. On this basis, the staff concludes this deviation is acceptable.”

Submit for NRC Approval

Limited amounts of thermoplastic cables are installed at Davis-Besse and they account for less than 10% of the cables in trays. These cables are primarily used in low-voltage, non-safety related instrumentation, and are routed separately from cables for safety-related systems. See Attachment L for requested NRC approval regarding the limited use of cables with non-qualified thermoplastic insulation.

Will Comply with the use of Commitment

Open Item DB-1964 calls for revision of the cable installation specification to ensure future compliance and is included in Attachment S.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

- CR 10-74188, "NFPA 805 Discrepancies with Cable Jacket Material"

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

Item Number	DB-1964	**Item Title:** Revise Cable Specifications

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.6

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.

Compliance Basis:

Where metal roof deck construction is used, the roofing materials are Class A construction per Underwriters' Laboratories, Inc. This is consistent with the requirements of Class A roof coverings as determined by tests described in NFPA 256.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

- Specification A-001, Section B-6, Rev. 16, "Built-Up Roofing, Roof Insulation, Vapor Barrier and Membrane Waterproofing"

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Bulk compressed or cryogenic flammable gas storage is not located inside structures containing systems, equipment, or components important to nuclear safety.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- C-FP-013.10-006, Rev. 4, "Combustible Loading Analysis"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"
- C-0016, Rev. 33, "Plant Plot Plan"
- DB-OP-06033, Rev. 14, "Hydrogen Addition and Degassification"
- C-0073, Rev. 9, "Yard Structures H2/N2 Storage Foundation Plans, Sections & Details"
- PFP-YD-PROT, Rev. 6, "Protected Area Yard, General"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Complies by Previous NRC Approval

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.

Compliance Basis:

Complies

Storage of flammable gas cylinders is located outdoors, or in separate detached buildings. Davis-Besse complies with hydrogen storage requirements per NFPA 50A-1973. NFPA 50A-1973 is the code of record for Davis-Besse.

Complies by Previous Approval

NRC Safety Evaluation dated May, 30, 1991 (ML033490026) states: “During its review of the NFPA conformance analyses, the staff requested clarification on a number of issues including the lack of automatic shutoff valves for some of the flammable liquid tanks, maintenance of hydrogen system features, and ventilation in Seal Oil Room No. 333. The licensee provide satisfactory responses to these requests in its letter dated October 11, 1989. On this basis, the staff concludes that this issue is resolved.”

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- PFP-H2-TLR, Rev. 3, "Hydrogen Storage Trailer"
- PFP-YD-PROT, Rev. 6, "Protected Area Yard, General"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- C-0016, Rev. 33, "Plant Plot Plan"
- PFP-YD-CRYO, Rev. 5, "Cryogenic Storage Area"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies with use of EEEE

3.3.7.2

Outdoor high-pressure flammable gas storage containers shall be located so that the long axis is not pointed at buildings.

Compliance Basis:

Complies with use of EEEE

Fire Pre-Plan PFD-YD-PROT depicts the hydrogen and propane storage tanks locations. These tanks are orientated with the long axis toward buildings. The propane tanks are approximately 43 feet north from the Turbine Building and the hydrogen tanks are approximately 240 feet north from the Auxiliary Building. The Davis-Besse outdoor flammable gas storage tanks orientation were evaluated for compliance with NFPA 50A-1973, “Standard for Gaseous Hydrogen Systems at Consumer Sites” and NFPA 58-2004 “Liquefied Petroleum Gas Code” in accordance with NRC Generic Letter (GL) 86-10, “Implementation of Fire Protection Requirements.” The evaluation, C-FP-013.06-0121, concluded that the orientation of the tanks is acceptable.

Licensing Actions

- None

Supporting EEEEs

- C-FP-013.06-121

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- Serial No. 1718, "Fire Protection; Additional Information on the NFPA Standard Compliance Review"
- C-FP-013.06-121, Rev. 0, "Evaluation of the Hydrogen and Propane Tank’s Orientation"
- C-0016, Rev. 33, "Plant Plot Plan"
- PFP-YD-CRYO, Rev. 5, "Cryogenic Storage Area"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- C-0073, Rev. 9, "Yard Structures H2/N2 Storage Foundation Plans, Sections & Details"
- Log No. 4925, "Staff Evaluation Report for Generic Letter 88-20, October 2, 1996"
- PFP-H2-TLR, Rev. 3, "Hydrogen Storage Trailer"
- PFP-YD-PROT, Rev. 6, "Protected Area Yard, General"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.7.3

Flammable gas storage cylinders not required for normal operation shall be isolated from the system.

Compliance Basis:

At Davis-Besse, flammable gas storage cylinders not required for normal operation are isolated from the system per procedures.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- DB-FP-00018, Rev. 12, "Control of Ignition Sources"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Complies by Previous NRC Approval
- Will Comply with the Use of Commitment

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.

Compliance Basis:

Complies

Bulk flammable and/or combustible liquid storage is not located in structures containing components, systems, or equipment important to nuclear safety. Where large quantities of flammable and/or combustible liquids exist inside structures at Davis-Besse, these are part of a designed system; therefore, do not fall under the category of bulk storage.

Complies by Previous NRC Approval

Non-compliances with NFPA 30 have been resolved through previous NRC Approval in SER dated May 30, 1991

An excerpt from Log 3480, dated May 30, 1991, is as follows:

"Consequently, the licensee provided supplemental information which explicitly identified deviations from staff fire protection guidelines and the relevant National Fire Protection Association (NFPA) Standards and provided justification as to why these deviations were not safety significant. The staff considers these deviations to fall within two categories. The first are those deviations which represent minor variances. These minor variances and those features of the Davis-Besse Fire Protection Program which conform with NRC and NFPA criteria are described comprehensively in the documents cited above and are not discussed in detail this safety evaluation since the staff finds that the minor deviations are acceptable. The second category are those deviations which are not considered by the staff to be minor variances and for which there was, initially some concern on the part of the staff regarding the licensees justification of its technical approach. The staff's basis for accepting these latter deviations is contained in the following evaluation."

"Finally, in its comparison of the fire protection program with the criteria of NFPA Standard No. 30, the licensee identified a deviation in its letter dated July 31, 1989 pertaining to the quantity of flammable and combustible liquids located outside of any storage area. To evaluate this issue, the staff reviewed Administrative Procedure DB-FP-00007 (Revision 00) which covers the control of transient combustibles. The procedure limits quantities of flammable and combustible liquids as well as other combustible materials to that necessary for plant operations. When excess quantities are present in an area, prior approval per the procedure is necessary and, in certain configurations, additional compensatory fire protection measures are taken. The staff concludes that the subject procedure and the noted deviation from NFPA Standard No. 30 are acceptable."

3.3 Prevention

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Will Comply with Use of Commitment

The combustible loading calculation, C-FP-013.10-006, will be revised to include the Station Blackout Diesel Generator (SBODG) building. In addition, a NFPA 30 code compliance evaluation using the code edition that was in effect at the time of installation will be documented for SBODG diesel fuel oil tank T210. These items are being tracked in LAR Attachment S open item DB-1900.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-FP-013.10-006, Rev. 4, "Combustible Loading Analysis"
- NG-DB-00302, Rev. 9, "Fire Protection Program"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

Item Number	DB-1900	**Item Title:** Include SBO Diesel Building in C-FP-013.10-006 and Review SBO DG Day Tank to NFPA 30

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.3 Prevention

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Will Comply with the Use of Commitment

3.3.9

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.

Compliance Basis:

Procedures will be revised to include inspections to verify that transformer oil collection basins and drain paths are free of debris and capable of performing their design function.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- DB-FP-04042, Rev. 14, "Startup Transformer 02 Deluge Test"
- DB-FP-04041, Rev. 12, "Startup Transformer 01 Deluge Test"
- DB-FP-04043, Rev. 9, "Bus tie Transformer AC Deluge Test"
- DB-FP-04044, Rev. 11, "Bus tie Transformer BD Deluge Test"
- DB-FP-04045, Rev. 9, "Main Transformer Deluge Test"
- DB-FP-04046, Rev. 8, "Auxiliary Transformer 11 Deluge Test"

Open Items and VFDRs

Item Number DB-0540 **Item Title:** 3.3.9 – Revise Transformer Inspection Procedure for Gravel Bed Drainage

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Administrative procedures establish controls to prevent combustible liquids from coming in contact with hot pipes and surfaces, including insulated pipes and surfaces. Procedures also require prompt cleanup of oil spills.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NOP-OP-1012, Rev. 7, "Material Readiness and Housekeeping Inspection Program"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"
- DB-FP-00018, Rev. 12, "Control of Ignition Sources"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.11

Adequate clearance, free of combustible material, shall be maintained around energized electrical equipment.

Compliance Basis:

Administrative controls are implemented in station procedures to maintain adequate clearance, free of combustible material, around energized electrical equipment.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NG-DB-00302, Rev. 9, "Fire Protection Program"
- DB-FP-00007, Rev. 12, "Control of Transient Combustibles"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Complies by Previous NRC Approval

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.

Compliance Basis:

Complies

The RCP oil collection system is seismically designed and installed. Refer to the following subsections for compliance with items (1) through (5).

Complies by Previous Approval

By previous NRC approval, Davis-Besse satisfies NFPA criteria to safely contain leakage from the oil collection system for off normal conditions such as accident conditions or earthquakes. NRC approved the use of remote fill lines with a condition of additional safety precautions taken during the fill operation.

The previous approval excerpt from Log 1586, dated August 20, 1984 (ML021190037), is as follows:

“Based on our evaluation as discussed above, we conclude that the existing RCP motor lube oil collection system provides a level of safety equivalent to the technical requirements of Section III.O and, therefore, the exemption request is granted.”

Licensing Actions
- 12 Reactor Coolant Pumps Oil Collection System

Supporting EEEEs
- No Evaluations

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- Serial No. 991, "Topic: Appendix R Exemption Requests, September 30, 1983"
- SP-820, Rev. 1, "Pipe Stress Analysis - RCP Oil Drip Pan Drain"
- SP-821, Rev. 1, "Pipe Stress Analysis - RCP Oil Drip Pan Drain"
- FSK-M-HBD-427-2-H, Rev. 5, "R.C. Pump No. (1-1-1) Oil Drip Pan Drain"
- FSK-M-HBD-427-4-H, Rev. 4, "RC Pump No.# (1-1-2) Oil Drip Pan Drain"
- FSK-M-HBD-427-6-H, Rev. 2, "RC Pump No. (1-2-1) Oil Drip Pan Drain"
- FSK-M-HBD-427-8-H, Rev. 5, "R.C. Pump No. (1-2-2) Oil Drip Pan Drain"
- C-CSS-064.03-008, Rev. 3, "Pipe Stress Analysis for R.C. Pump Oil Drip Pan Drain"
- Log No. 1586, "Exemption From Certain Requirements of Appendix R to 1OCFR50"
- C-CSS-013.10-001, Rev. 0, "RCP Oil Lift System Enclosure"
- FSK-M-HBD-427-1-H, Rev. 4, "R.C. Pump No# (1-1-1) Oil Drip Pan Drain"
- FSK-M-HBD-427-3-H, Rev. 5, "RC Pump N). (1-1-2) Oil Drip Pan Drain"
- FSK-M-HBD-427-5-H, Rev. 4, "RC Pump No (1-2-1) Oil Drip Pan Drain"
- FSK-M-HBD-427-7-H, Rev. 4, "RC Pump No. (1-2-2) Oil Drip Pan Drain"
- DB-MM-01013, Rev. 7, "Lubricant Addition"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Complies by Previous NRC Approval
- Submit for NRC Approval

3.3.12(1)

(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.

Compliance Basis:

Complies

Davis-Besse satisfies the criteria that 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. The RCP oil fill operations were reviewed and accepted by the NRC in a separate issuance of exemption.

Complies by Previous Approval

The previous approval excerpt from Log 5205 (ML021260237), dated January 30, 1998, for the RCP oil fill operation is as follows:

“On the basis of the enclosed Safety Evaluation, the NRC staff concluded that the design of the oil filling system and the level of protection provided by the licensee through the use of certain compensatory measures during the oil fill operations provides reasonable assurance that a lube oil fire will not occur.”

“The staff also concluded that a worst-case postulated fire, from not having a lube oil collection system for the RCP lube oil fill lines, would be of limited magnitude and extent. In addition, the staff concluded that such a fire would not cause significant damage in the containment building and would not prevent operators from achieving and maintaining safe shutdown conditions. Accordingly, in light of the foregoing, the staff concluded that application of this oil collection system requirement is not necessary to achieve the underlying purpose of the rule.”

Submit For NRC Approval

Lubricating oil that atomizes and forms small droplets from normal motor operation and is released through the RCPs into its air cooling ventilation is not a significant amount and does not create an unaccountable increase of combustible load inside containment; therefore, the RCP Oil Collection System still complies with the requirement to collect lubricating oil from all pressurized and non-pressurized leakage sites. The potential for minimal amount of atomized oil misting request is included in LAR Attachment L for NRC approval.

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.3 Prevention

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Licensing Actions

- 12 Reactor Coolant Pumps Oil Collection System

Supporting EEEEs

- No Evaluations

References

- Serial No. 991, "Topic: Appendix R Exemption Requests, September 30, 1983"
- Serial No. 2493, "Request for Exemption from 10 CFR 50, Appendix R, Section III.O, Oil Collection System for Reactor Coolant Pumps"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- FSK-M-HBD-427-4, Rev. 6, "R.C. Pump No.# (1-1-2) Oil Drip Pan Drain"
- FSK-M-HBD-427-3, Rev. 5, "R.C. Pump No. (1-1-2) Oil Drip Pan Drain"
- FSK-M-HBD-427-1, Rev. 4, "R.C. Pump No# (1-1-1) Oil Drip Pan Drain"
- FSK-M-HBD-427-6, Rev. 4, "R.C. Pump No. (1-2-1) Oil Drip Pan Drain"
- Log No. 1586, "Exemption From Certain Requirements of Appendix R to 1OCFR50"
- Log No. 5205, "Issuance of Exemption from the Requirements of 10 CFR Part 50, Appendix R"
- FSK-M-HBD-427-8, Rev. 5, "R.C. Pump No. (1-2-2) Oil Drip Pan Drain"
- FSK-M-HBD-427-2, Rev. 5, "R.C. Pump No. (1-1-1) Oil Drip Pan Drain"
- ML103630612, Rev. 12/29/10, "ONS NFPA 805 SER"
- FSK-M-HBD-427-5, Rev. 5, "R.C. Pump No. (1-2-1) Oil Drip Pan Drain"
- FSK-M-HBD-427-7, Rev. 5, "R.C. Pump No. (1-2-2) Oil Drip Pan Drain"

Open Items and VFDRs

Item Number DB-2001 **Item Title:** DB 805 Att. L 3.3.12 (1) & 3.3.12 (4) RCP Oil Misting Exemption Request

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

3.3.12(2)

(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.

Compliance Basis:

The NRC accepted lube oil collection system exemption request to contain the entire contents of the RCP oil system inventory in a closed, vented container. The granted exemption concluded that the existing RCP oil collection system provides a level of safety equivalent to the technical requirements of Section III.O.

The excerpt from the granted exemption for a single oil collection tank per RCS loop is in Log No. 1586 (ML021190037), dated August 20, 1984, and is as follows:

"Section III.0 of Appendix R to 10 CFR 50 requires, in part, that the reactor coolant pump lube oil collection system be designed to collect lube oil leakage in a closed, vented container that can hold the entire lube oil system inventory. The licensees have requested exemption from this requirement.

The Davis-Besse Nuclear Power Station is designed with two reactor coolant loops. Each loop has two reactor coolant pumps (RCP). A high pressure and low pressure lube oil system is provided for each RCP motor. The high pressure system is used only during startup and shutdown. The low pressure system is used during normal operation. Each RCP motor contains 225 gallons of lube oil.

The licensees have provided one 250 gallon oil collection tank for each loop. This provides sufficient capacity to hold the total lube oil inventory of only one RCP motor in each loop with some margin. Any lube oil overflow will drain to the containment sump.

The RCP motor lube oil system does not comply with Section III.0 because the oil collection tank is not sized to contain the entire lube oil system inventory.

Since any lube oil overflow will drain to the containment building sump where there is no other flammable material or hot surfaces which may ignite the oil, the overflow oil will not present an exposure fire hazard to or otherwise endanger safety-related equipment, and since the RCP motor lube oil collection system is capable of withstanding the safe shutdown earthquake, we find the oil collection system acceptable.

Based on our evaluation as discussed above, we conclude the existing RCP motor lube oil collection system provides a level of safety equivalent to the technical requirements of Section III.0 and, therefore, the exemption requested is granted."

Licensing Actions

- 12 Reactor Coolant Pumps Oil Collection System

Supporting EEEEs

- No Evaluations

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- Serial No. 991, "Topic: Appendix R Exemption Requests, September 30, 1983"

- Log No. 1586, "Exemption From Certain Requirements of Appendix R to 1OCFR50"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.12(3)

(3) A flame arrestor is required in the vent if the flash point characteristics of the oil present the hazard of a fire flashback.

Compliance Basis:

The oil vapor-air mixture at the tank vent, as well as the oil inside the tank, is not expected to reach the oil flash point temperature due to the lack of ignition sources near the oil collection tanks and the availability of oil overflow drains. Consequently, the oil does not present the hazard of a fire flashback to the oil collection tank; therefore, a flame arrestor is not required in the vent.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Serial No. 991, "Topic: Appendix R Exemption Requests, September 30, 1983"
- Log No. 1586, "Exemption From Certain Requirements of Appendix R to 1OCFR50"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Complies by Previous NRC Approval
- Submit for NRC Approval

3.3.12(4)

(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.

Compliance Basis:

Complies

Davis-Besse satisfies the criteria that 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. The RCP oil fill operations were reviewed and accepted by the NRC in a separate issuance of exemption.

Complies by Previous NRC Approval

By previous NRC approval, Davis-Besse satisfies the criteria to protect leakage points on the oil collection system.

The previous approval excerpt from Log 5205 (ML021260237), dated January 30, 1998, for the RCP oil fill operation is as follows is as follows:

“The staff has determined that the design of the oil filling system and the level of protection provided during oil fill operations provide reasonable assurance that a lube oil fire will not occur. This is contingent on the application of the compensatory measures itemized in the licensees' November 18, 1997, exemption request.

The staff has also determined that, in the event of a worst-case postulated fire due to the absence of a lube oil collection system for the remote lube oil fill lines, the fire would be of limited magnitude and extent. In addition, such a fire would not cause significant damage in the containment building and would not prevent the operators from achieving and maintaining safe shutdown conditions.

The staff has concluded that special circumstances are present in that an oil collection system for the RCP lube oil fill lines is not necessary to achieve the underlying purpose of the rule, and that an exemption as described herein is authorized by law, will not present and undue risk to public health and safety, and is consistent with the common defense and security. Therefore, the licensees’ request for exemption should be granted.”

Submit for NRC Approval

It is normal for large motors to lose some oil through seals, and minor drips and drops may occur. The volume of oil lost through these drips is not significant enough to constitute a hazard.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Lubricating oil that has been 'atomized' from normal motor consumption and released through the RCPs into its air cooling ventilation is not a significant amount and does not create an uncountable increased combustible load inside containment; therefore, the RCP Oil Collection System still complies with the requirement to collect lubricating oil from all pressurized and non-pressurized leakage sites. The potential for minimal amount of atomized oil misting is included in LAR Attachment L for NRC approval.

Licensing Actions

- 12 Reactor Coolant Pumps Oil Collection System

Supporting EEEEs

- No Evaluations

References

- Serial No. 991, "Topic: Appendix R Exemption Requests, September 30, 1983"
- Log No. 5205, "Issuance of Exemption from the Requirements of 10 CFR Part 50, Appendix R"
- ML103630612, Rev. 12/29/10, "ONS NFPA 805 SER"
- Serial No. 2493, "Request for Exemption from 10 CFR 50, Appendix R, Section III.O, Oil Collection System for Reactor Coolant Pumps"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

Item Number DB-2001 **Item Title:** DB 805 Att. L 3.3.12 (1) & 3.3.12 (4) RCP Oil Misting Exemption Request

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.3.12(5)

(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.

Compliance Basis:

The existing RCP lube oil collection piping and catch basin are adequately designed and constructed to collect and drain the potential maximum lube oil leak from the RCP lube oil pump, with no overflow concern.

Licensing Actions

- 12 Reactor Coolant Pumps Oil Collection System

Supporting EEEEs

- No Evaluations

References

- Log No. 1586, "Exemption From Certain Requirements of Appendix R to 1OCFR50"
- C-ME-064.03-013, Rev. 2, "RCP Oil Collection System"

Open Items and VFDRs

-None

3.4 Industrial Fire Brigade

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - N/A

3.4.1

On-Site Fire-Fighting Capability. All of the following requirements shall apply.

Compliance Basis:

This is a general introductory statement section. Please refer to the following subsections for the specific NFPA 805 requirements.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

-None

3.4 Industrial Fire Brigade

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies with use of EEEE
- Will Comply with the Use of Commitment

3.4.1(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.

Compliance Basis:

Complies with use of EEEE

Fire brigade training at DBNPS was evaluated in accordance with GL 86-10 against the requirements of NFPA 600 and documented the results in SAP Notification 600861369, NFPA 600-2000, Industrial Fire Brigades. The evaluation concludes that DBNPS complies with applicable portions of NFPA 600 except Sections 2-1.1(11), 2-2.2.4, 2-3.9, and 5-3.3.

Will Comply with use of Commitment

The NFPA 600 evaluation determined that some fire brigade document changes are required. The changes include requests to establish a funding policy for brigade training and equipment, to establish a system of accountability during a fire response, to add NFPA 600 review to brigade training and to proceduralize maintenance of protective clothing. These changes are being tracked in LAR Attachment S Open Item DB-0541.

Licensing Actions

- None

Supporting EEEEs

- SAP Notification 600861369

References

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Item Number DB-0541 **Item Title:** Fire Brigade Policies and Practices require changes based on the NFPA 600 code review

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.4 Industrial Fire Brigade

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.1(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.

Compliance Basis:

The site fire brigade members at Davis-Besse are not relied upon for safe shutdown essential functions in the event of a fire emergency.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00005, Rev. 6, "Fire Brigade"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.1(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 criteria. Exception to (c): Sufficient training and knowledge shall be permitted to be provided by an operations advisor dedicated to industrial fire brigade support.

Compliance Basis:

The fire brigade members at Davis-Besse are qualified through a training program that is maintained by the Nuclear Training Department. Qualification requirements detailed in qualification manuals FBI-900 and FBI-950 include knowledge of plant systems, layout, and general operation, as well as fire fighting skills and attack strategy.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- FBI-900, Rev. 8, "Fire Brigade Member Qualification Manual"
- FBI-950, Rev. 8, "Fire Brigade Captain Qualification Manual"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

3.4.1(d)

The industrial fire brigade shall be notified immediately upon verification of a fire.

Compliance Basis:

Complies

The Davis-Besse Fire Brigade activation procedure notifies the fire brigade upon report of a fire by an individual, multiple detection alarms received from adjacent rooms or Fire Detection Zones, or receipt of a single detection alarm with simultaneous start of a fire pump.

Will Comply with Commitment

The Davis-Besse Fire Brigade activation procedure will be revised to dispatch the fire brigade upon confirmation of a sustained fire protection water flow instead of a single detection alarm in conjunction with the start of a fire pump or continuous flow alarm. The revision will also clarify that the fire brigade will be dispatched upon the receipt of multiple detection alarms within a single room or Fire Compartment, and that the fire brigade will continue to be notified upon the report of a fire by an individual. This activity is being tracked by LAR Attachment S, Open Item DB-0759.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

- Serial No. 1772, "Toledo Edison Comments on Draft Fire Protection Program Safety Evaluation Report, February 20, 1990"

- Serial No. 1-893, "Request for Deviations on Assembly of the Fire Brigade, September 30, 1989"

Open Items and VFDRs

Item Number DB-0759 **Item Title:** Revise control fire alarm response procedure

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.4 Industrial Fire Brigade

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.1(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 firefighting operations. The physical examination shall determine the ability of each member to use respiratory protection equipment.

Compliance Basis:

Each industrial fire brigade member completes an annual physical examination and an annual practice session, which determines the ability of each member to perform the strenuous activity required during manual firefighting operations and the ability of each member to use respiratory protection equipment (Self-Contained Breathing Apparatus).

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NT-OT-07007, Rev. 8, "Fire Brigade Training"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

3.4.2

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.

Compliance Basis:

Complies

Administrative procedures maintain current and detailed pre-fire plans available to the industrial fire brigade. Existing pre-fire plans were verified for the areas that can affect the ability to meet the performance criteria of Section 1.5 of NFPA 805.

Will Comply with use of Commitment

Additional rooms will be included in pre-fire plans to ensure that all areas that can affect the ability to meet the performance criteria of Section 1.5 of NFPA 805 are provided with pre-fire plans. This activity is being tracked by LAR Attachment S, Open Items DB-1074, DB-1093, and DB-1095.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00003, Rev. 8, "Pre-Fire Plan Guidelines"

Open Items and VFDRs

Item Number	DB-1074	**Item Title:** Task 1.2; Include Rooms 330, 317A, 605, 417A in Pre-fire plans
Item Number	DB-1093	**Item Title:** Task 4.0; Add room 468 to Pre-Fire Plans Radiological Hazard 1.2
Item Number	DB-1095	**Item Title:** Task 4.0; Pre-Fire Plan needed for RCP motor storage and SGW/RAM areas

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

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.

Compliance Basis:

Complies

Administrative procedures ensure that pre-fire plans detail the fire area configuration and fire hazards to be encountered in the fire area, along with fire protection systems and features that are present. This information was verified to be included in pre-fire plans.

Will Comply with use of Commitment

Risk significant safe-shutdown components and prevention of radioactive release will be added to pre-fire plans after the revised safe-shutdown analysis has been completed to have a final list of safe-shutdown components. Prevention of radioactive release will be added to the pre-fire plans. This activity is being tracked by LAR Attachment S, Open Items DB-0341 and DB-0538.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00003, Rev. 8, "Pre-Fire Plan Guidelines"

Open Items and VFDRs

Item Number	DB-0341	**Item Title:** Fire Plans require revision to include action for Radioactive Release
Item Number	DB-0538	**Item Title:** 3.4.2.1 – Requires Review of Pre-Fire Plans Against Safe Shutdown Analysis

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.2.2

Pre-fire plans shall be reviewed and updated as necessary.

Compliance Basis:

Site administrative procedures ensure that the pre-fire plans are reviewed and updated as necessary.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00003, Rev. 8, "Pre-Fire Plan Guidelines"
- NG-DB-00302, Rev. 9, "Fire Protection Program"

Open Items and VFDRs

-None

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.4 Industrial Fire Brigade

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.2.3

Pre-fire plans shall be available in the control room and made available to the plant industrial fire brigade.

Compliance Basis:

Pre-fire plans at Davis-Besse are available in the Control Room and are available to the site Fire Brigade.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00003, Rev. 8, "Pre-Fire Plan Guidelines"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.2.4

Pre-fire plans shall address coordination with other plant groups during fire emergencies.

Compliance Basis:

Pre-fire plans address coordination with other plant groups during fire emergencies.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- DB-FP-00005, Rev. 8, "Fire Brigade"
- DB-FP-00003, Rev. 6, "Pre-Fire Plan Guidelines"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.3

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.

Compliance Basis:

Fire Brigade members and support personnel at Davis-Besse are provided with training commensurate with their emergency responsibilities demonstrated in periodic drills and exercises.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NT-OT-07007, Rev. 8, "Fire Brigade Training"
- DB-HP-00003, Rev. 5, "Radiological Surveillance Program"
- NOP-LP-5011, Rev. 7, "Emergency Response Drill and Exercise Program"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies with use of EEEE
- Will Comply with the Use of Commitment

3.4.3(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.

Compliance Basis:

Complies with use of EEEE

Fire brigade training at DBNPS was evaluated in accordance with GL 86-10 against the requirements of NFPA 600 and documented the results in SAP Notification 600861369, NFPA 600-2000, Industrial Fire Brigades. The evaluation concludes that DBNPS complies with applicable portions of NFPA 600 except Sections 2-1.1(11), 2-2.2.4, 2-3.9, and 5-3.3.

Will Comply with use of Commitment

The NFPA 600 evaluation determined that some fire brigade document changes are required. The changes include requests to establish a funding policy for brigade training and equipment, to establish a system of accountability during a fire response, to add NFPA 600 review to brigade training and to proceduralize maintenance of protective clothing. These changes are being tracked in LAR Attachment S Open Item DB-0541.

NFPA 805 paragraph 3.4.3(a) subsection (2) requires additional training for radiological and health physics considerations. These changes are being tracked in LAR Attachment S Open Item DB-0341.

Licensing Actions

- None

Supporting EEEEs

- SAP Notification 600861369

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Non-Fire Compartment Specific
Transition Report

Davis-Besse

3.4 Industrial Fire Brigade

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- NT-OT-07007, Rev. 8, "Fire Brigade Training"

Open Items and VFDRs

Item Number	DB-0341	**Item Title:** Fire Plans require revision to include action for Radioactive Release
Item Number	DB-0541	**Item Title:** Fire Brigade Policies and Practices require changes based on the NFPA 600 code review

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

3.4.3(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.

Compliance Basis:

Complies

Site administrative procedures ensure that radiological and nuclear security personnel are trained to respond to fire emergencies as requested, interface with the Fire Brigade as necessary, and provide support within their training.

Will Comply with the Use of Commitment

The Fire Brigade training procedure will be updated to addresses specific steps for containment and monitoring of potentially contaminated fire suppression effluents. This is being tracked in LAR Attachment S open item DB-0557.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

Item Number	DB-0557	**Item Title:** Revise Fire Brigade Drills to Include Areas Essential to Plant Operation, Safe Shutdown Areas, and to Control Radioactive Release

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

3.4.3(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.

(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.

Compliance Basis:

Complies

(1) Fire brigade members are required to attend at least one drill per quarter.
(2) Fire brigade drills assess the fire brigade's ability to respond to, control, and extinguish fires. This includes performance as a team, using necessary equipment, performing rescue operations, adapting to changing plant conditions and/or hazardous conditions. Each fire drill is critiqued, and strengths and weaknesses are identified.
(4) Drill records are maintained detailing the drill scenario, objective, and assessment.
(5) A critique is held and documented after each drill.

Will Comply with use of Commitment

(3) Fire brigade drills will be verified to be conducted in all areas of the plant required to meet NFPA 805 performance criteria, including those essential to plant operation and to contain significant fire hazards. This is being tracked in LAR Attachment S in open item DB-0557.

3.4 Industrial Fire Brigade

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- NT-OT-07007, Rev. 8, "Fire Brigade Training"

Open Items and VFDRs

Item Number	DB-0557	**Item Title:** Revise Fire Brigade Drills to Include Areas Essential to Plant Operation, Safe Shutdown Areas, and to Control Radioactive Release

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies with use of EEEE
- Will Comply with the Use of Commitment

3.4.4

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.

Compliance Basis:

Complies with use of EEEE

Fire brigade training at DBNPS was evaluated in accordance with GL 86-10 against the requirements of NFPA 600 and documented the results in SAP Notification 600861369, NFPA 600-2000, Industrial Fire Brigades. The evaluation concludes that DBNPS complies with applicable portions of NFPA 600 except Sections 2-1.1(11), 2-2.2.4, 2-3.9, and 5-3.3.

Will Comply with use of Commitment

The NFPA 600 evaluation determined that some fire brigade document changes are required. The changes include requests to establish a funding policy for brigade training and equipment, to establish a system of accountability during a fire response, to add NFPA 600 review to brigade training and to proceduralize maintenance of protective clothing. These changes are being tracked in LAR Attachment S Open Item DB-0541.

Licensing Actions

- None

Supporting EEEEs

- SAP Notification 600861369

References

- None

Open Items and VFDRs

Item Number	DB-0541	**Item Title:** Fire Brigade Policies and Practices require changes based on the NFPA 600 code review

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.5.1

Off-site fire authorities shall be offered a plan for their interface during fires and related emergencies on site.

Compliance Basis:

Site administrative procedures ensure that off-site fire authorities are provided with training for their interface during fires and related emergencies on site at Davis-Besse.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.5.2

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.

Compliance Basis:

Site administrative procedures ensure that fire fighters from off-site fire authorities who are expected to respond to a fire at the plant are provided with training and are invited to participate in at least one drill per year.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.5.3

Plant security and radiation protection plans shall address off-site fire authority response.

Compliance Basis:

Site administrative, abnormal, and emergency plan procedures ensure that Radiological Protection and Nuclear Security personnel support the off-site fire authority response.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- RA-EP-02861, Rev. 04, "Emergency Plan Off Normal Occurrence Procedure"
- RA-EP-02890, Rev. 2, "Emergency Response Organization Response to Security events or Threats"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.4.6

An effective emergency communications capability shall be provided for the industrial fire brigade.

Compliance Basis:

The site Fire Brigade is provided with an effective, multi-faced communications capability via the Public Address (Gai-Tronics) System and the UHF Radio System. Each Fire Brigade member is provided with an emergency communications device for effective communication.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-035, Rev. 3, "Communication Systems"

Open Items and VFDRs

-None

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

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.

Compliance Basis:

Complies by Previous Approval

The fire protection water supply at Davis-Besse has adequate reliability, quantity, and duration. NRC Log No. 3480 states: "The fire protection water supply consists of an electric fire pump which takes suction from a 250,000 gallon tank and a diesel pump which draws water from Lake Erie. The tank is not sized in accordance with Appendix A to the BTP, nor are the two fire protection water supplies directly interconnected. The staff considers the size of the tank to be sufficient because the criteria of Appendix A to the BTP used to determine the required water storage capacity at Davis-Besse assumes 1,000 gallons per minute (gpm) for fire hose streams. However, the actual capability of the licensee's fire brigade to deliver water during a fire is in the range of 250 to 500 gpm with a five person fire brigade using the 1 1/2 and 2 1/2 inch hoses. Moreover, if additional water greater than the tank capacity is required, an unlimited supply exists from the adjacent lake. Interconnection of the fire protection water supplies is not considered necessary because each pumping system supplying water is sufficiently reliable based on the performance of periodic testing and maintenance and because either pump is capable of satisfying the water demand requirements. The staff therefore, concludes that the fire protection water supply is acceptable even though it deviates from NRC fire protection guidelines."

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- C-FP-013.04-004, Rev. 1, "Fie Water Supply for Sprinkler / Waterspray Systems for Room 314"

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

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.

Compliance Basis:

Complies by Previous Approval

Previous NRC approval of the fire Water Storage Tank arrangement was granted in Log No. 3480 which states, "The fire protection water supply consists of an electric fire pump which takes suction from a 250,000 gallon tank and a diesel pump which draws water from Lake Erie. The tank is not sized in accordance with Appendix A to the BTP, nor are the two fire protection water supplies directly interconnected. The staff considers the size of the tank to be sufficient because the criteria of Appendix A to the BTP used to determine the required water storage capacity at Davis-Besse assumes 1,000 gallons per minute (gpm) for fire hose streams. However, the actual capability of the licensee's fire brigade to deliver water during a fire is in the range of 250 to 500 gpm with a five person fire brigade using the 1½ and 2½ inch hoses. Moreover, if additional water greater than the tank capacity is required, an unlimited supply exists from the adjacent lake. Interconnection of the fire protection water supplies is not considered necessary because each pumping system supplying water is sufficiently reliable based on the performance of periodic testing and maintenance and because either pump is capable of satisfying the water demand requirements. The staff therefore, concludes that the fire protection water supply is acceptable even though it deviates from NRC fire protection guidelines."

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016A, Rev. 55, "P&ID, Station Fire Protection System"

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

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.

Compliance Basis:

Complies by Previous Approval

The fire pumps are independent and capable of supplying 100 percent of the required flow rate and pressure. The NFPA 20 code review was sent to the NRC as documented in Serial No. 1685.

In the NFPA 20 code sections where the fire pumps deviated from the installation requirements, the NFPA 20 code comparison review cites appropriate justifications. The NRC reviewed Serial No. 1685 and accepted these deviations and commitments for modifications in Log No. 3480 dated May 30, 1991 which states: "The staff has reviewed the subject deviations and concludes that with the existing surveillance testing, these particular deviations are acceptable."

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

One diesel engine driven fire pump is provided; therefore, two Class 1E electric fire pumps are not required. In addition to the diesel engine driven fire pump, there is one non-Class 1E electric motor driven fire pump. Each fire pump is designed to meet the water flow and pressure demands of the largest credited suppression system plus hose stream allowance to provide redundancy.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- USAR, Rev. 30, "Updated Final Safety Analysis Report"
- FHAR, Rev. 26, "Fire Hazards Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Submit for NRC Approval

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.

Compliance Basis:

Complies

Each fire pump and associated driver at Davis-Besse is separated from the others and from the rest of the plant by rated fire barriers.

Submit for NRC Approval

Separation between the remote start circuit cables running from the Control Room to each respective fire pump is included in Attachment L.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- IN 2009-29, Rev. 0, "Potential Failure of Fire Water Supply Pumps to Auto Start due to a Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Order #200395580, Rev. 0, "Potential Failure of Fire Water Supply Pumps to Auto Start due to a Fire"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.5.6

Fire pumps shall be provided with automatic start and manual stop only.

Compliance Basis:

Both the electric motor driven and diesel engine driven fire pumps are provided with automatic start and may only be stopped manually.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.5.7

Individual fire pump connections to the yard fire main loop shall be provided and separated with sectionalizing valves between connections.

Compliance Basis:

Each fire pump is provided with an individual connection to the yard fire main loop through individual post indicator valves. Each connection to the yard fire main loop is also separated with sectionalizing post indicator valves in the yard fire main loop on either side of each connection.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- M-016A, Rev. 55, "P&ID, Station Fire Protection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.5.8

A method of automatic pressure maintenance of the fire protection water system shall be provided independent of the fire pumps.

Compliance Basis:

Davis-Besse uses a jockey pump to automatically maintain pressure in the fire protection water system under normal no flow conditions. This jockey pump is independent of the full-capacity fire pumps.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

3.5.9

Means shall be provided to immediately notify the control room, or other suitable constantly attended location, of operation of fire pumps.

Compliance Basis:

Upon operation of each fire pump, immediate notification is provided in the control room via illumination of distinct annunciators.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

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.

Compliance Basis:

Complies by Previous Approval

Underground fire service mains at Davis-Besse comply with requirements of NFPA 24 as described in Toledo Edison Letter Serial No. 1685, dated July 31, 1989 to the NRC.

Previous NRC approval is documented in NRC letter Log No. 3480 (ML033490026) which states: "In its letters dated May 23, 1988 and July 31, 1989 [Serial 1685], the licensee submitted a comparison of the Davis-Besse Fire Protection Program to the applicable NFPA standards. A number of deviations from these standards indicated in this analysis have been identified for correction. A summary of the proposed modifications in these two letters and the implementing schedules have been reviewed by the staff and found to be acceptable. One of the deviations the licensee identified is the absence of documentation for the water supply system; this documentation would have provided third party approval of certain equipment. However, in light of the continuing serviceability of the water supply since its installation and the cost associated with providing third party documentation for this equipment, the staff does not consider any further effort by the licensee to be justified. The licensee also indicated that certain components did not conform with some of the construction specifications identified in the applicable NFPA Standards. The licensee affirmed in the letters cited above that the construction materials and their performance characteristics are at least equivalent to those that are identified in the pertinent NFPA Standards. On this basis, the staff finds these deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

The yard fire main is provided with numerous post indicator valves such that a portion of the main can be isolated without affecting the entire system operability. The arrangements of supply piping from the yard fire main loop to building headers, loops, and directly to suppression systems allows for portions of the yard fire main loop to be isolated for maintenance or repair without affecting the supply to fixed fire suppression systems and manual fire hose stations. The fixed and manual suppression systems are connected to the water main so that an 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.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Hose threads provided for fire hydrants, standpipe risers, and fire hose are National Standard Hose Thread, which is compatible with threads used by local fire departments.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

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.

Compliance Basis:

At the time of construction, the DBNPS fire protection piping was not required to be designed to B31.1 or remain functional after a seismic event. Gate valves for systems and standpipes are specified as OS&Y type or other approved indicating type. The yard main system and fire protection headers at Davis-Besse comply with requirements of NFPA 24 as described in Toledo Edison Letter Serial No. 1685, dated July 31, 1989 to the NRC.

Previous NRC approval is documented in NRC letter Log No. 3480 (ML033490026) which states: “In its letters dated May 23, 1988 and July 31, 1989 [Serial 1685], the licensee submitted a comparison of the Davis-Besse Fire Protection Program to the applicable NFPA standards. A number of deviations from these standards indicated in this analysis have been identified for correction… The licensee affirmed in the letters cited above that the construction materials and their performance characteristics are at least equivalent to those that are identified in the pertinent NFPA Standards. On this basis, the staff finds these deviations acceptable.”

In addition, NRC issued notice of final rule (RIN 3150-AG48) in Federal Register, Volume 69, No.115, dated June 16, 2004 regarding Voluntary Fire Protection Requirements for Light Water Reactors; Adoption of NFPA 805 as a Risk-Informed, Performance-Based Alternative. With respect to seismic standpipes and hose stations under comment resolution, the RIN states: “A commenter noted that Appendix A to BTP APCSB 9.5-1 did not require seismically qualified standpipes and hose stations for operating plants and plants with construction permits issued prior to July 1, 1976. NRC agrees that Appendix A to BTP APCSB 9.5-1 made separate provisions for operating plants and plants with construction permits issued prior to July 1, 1976, and did not require seismically qualified standpipes and hose stations for those plants. Therefore, the requirement in Section 3.6.4 of NFPA 805 is not applicable to licensees with nonseismic standpipes and hose stations previously approved in accordance with Appendix A to BTP APCSB 9.5-1.” The statement in the RIN also supports that seismic fire protection piping is not a requirement for NFPA 805 Section 3.5.10.

Compensatory measures and additional administrative requirements ensure effective and adequate temporary fire protection for the subject areas during the time when the normal fire protection features are degraded.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- DB-FP-00009, Rev. 20, "Fire Protection Impairment and Fire Watch"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016A, Rev. 55, "P&ID, Station Fire Protection System"
- BTP APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants"

Open Items and VFDRs

-None

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Submit for NRC Approval

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.

3.5.14(a)
Electrical supervision with audible and visual signals in the main control room or other suitable constantly attended location.

3.5.14(b)
Locking valves in their normal position. Keys shall be made available only to authorized personnel.

3.5.14(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.

Compliance Basis:

Complies

Fire protection water supply and fire suppression system control valves are periodically inspected per procedure and are supervised using 3.5.14(b) and 3.5.14(c), supplemented by 3.5.14(a) on selected control valves.

Submit for NRC Approval

The fire protection curb box valves can not be supervised or sealed to meet NFPA requirement 3.5.14; therefore, the processes for ensuring proper valve position have been submitted for NRC approval.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- DB-FP-04031, Rev. 10, "Quarterly Fire Valve Alignment Verification"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

Hydrants are installed on the yard main system approximately every 250 feet. A code compliance review against the code of record confirms compliance with the requirements for hose houses and equipment as specified in NFPA 24, 1973 edition.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Will Comply with the Use of Commitment

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.

Compliance Basis:

Complies

The fire protection water supply system usage at Davis-Besse meets the criteria of NFPA 805 section 3.5.16 as procedures limit the temporary use of the fire suppression water supply when evaluated not to affect the ability of the water supply to suppress a fire.

The fire protection water supply system (Fire Water System) can be used as a secondary backup supply to the Auxiliary Feedwater Pumps (AFPs). This arrangement meets Exception No. 1 to Section 3.5.16 of NFPA 805 because the demand which necessitates the Fire Water System as a suction source to the AFPs does not occur simultaneously with the fire suppression demand, as described in the following analysis.

Will Comply with the Use of Commitment

Update documents per DB-1591 to state the current other uses for fire protection system water as a backup to the Auxiliary Feedwater System.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- DB-OP-06210, Rev. 17, "CO2 & Hydrogen System"
- NOP-OP-1014, Rev. 4, "Plant Status Control"
- DB-OP-06610, Rev. 33, "Station Fire Suppression Water System"
- NOP-CC-2003, Rev. 20, "Engineering Changes"
- SD-015, Rev. 4, "System Description for Auxiliary Feedwater System"

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.5 Water Supply

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Open Items and VFDRs

Item Number DB-1591 **Item Title:** Update Documents for FP Water System Connections

3.6 Standpipe and Hose Stations

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

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".

Compliance Basis:

Complies by Previous Approval

Standpipe and hose systems at Davis-Besse were evaluated against the requirements of NFPA 14 and submitted to the NRC in Serial No. 1685, dated July 31, 1989.

Previous NRC approval is documented in Log No. 3480 (ML033490026) which states: "As part of its comparison of the design of the standpipe and hose system to NRC fire protection guidelines and the criteria contained in NFPA Standard No. 14, the licensee identified several deviations in its letters dated January 6, 1988 and July 31, 1989 [Serial No. 1685]. Several of these deviations pertain to the use of unlisted equipment, use of materials which do not meet the construction specifications of this standard, and the nature of the acceptance testing. The staff reviewed these deviations, including the licensee's justification and concludes that these conditions will not adversely affect system performance and are, therefore, acceptable based on the continuing acceptable performance of these system."

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

3.6 Standpipe and Hose Stations

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

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.

Compliance Basis:

Complies by Previous Approval

Standpipe and Hose systems at Davis-Besse were evaluated to the requirements of NFPA 14 and then submitted to the NRC in Serial No. 1685, dated July 31, 1989, which states:

[Regarding water supply] "Based on the hydraulic calculations which verify the demand of the nozzles relative to the available supply is adequate for the installed conditions, it can be concluded that the intent of the standard [NFPA 14] has been met."

"No such pressure reducing devices are installed at DB-1 despite the fact that pressures can exceed 100 psi at many of the outlets" and concludes "The existing arrangement is considered acceptable based on the fire brigade and general orientation training provided."

Previous NRC approval is documented in Log No. 3480 (ML033490026) which references letters dated January 6, 1988 and July 31, 1989 [Serial No. 1685]. LOG No. 3480 states: "A number of deviations were identified related to the size of piping and system pressure and flow characteristics which result in certain locations where standpipe outlets are not able to deliver the quantity of water at sufficient pressure as required by the applicable NFPA Standard. As stated above in our evaluation of the plant water supply, the staff finds that the NFPA Code requirements for water for manual fire fighting are conservative in light of the fact that the smaller piping at the Davis-Besse plant can deliver at least 250 gpm per outlet. This is equivalent to flow from two 1½ inch hose lines or one 2½ inch hose line. The staff concludes that this capability is sufficient to suppress potential fires in the subject areas based on the limited combustible loadings in these areas.

Another deviation pertains to the lack of pressure reducing devices at standpipe outlets where the system pressure exceeds 100 psi. Because warning signs are posted at these locations and the fire brigade is trained to operate hoses at the higher pressure, the staff concludes that this condition is acceptable."

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.6 Standpipe and Hose Stations

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

- C-FP-013.03-002, Rev. 0, "Evaluation of Flow Availability for Fire Protection Demands"

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

3.6 Standpipe and Hose Stations

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies
- Submit for NRC Approval

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.

Compliance Basis:

Complies

The hose nozzles provided in each power block area at Davis-Besse are appropriate for the fire hazards in the area and the fire brigade is adequately trained on the use of appropriate spray patterns. The nozzles have shutoff capability and are able to control water flow from full open to full closed.

Submit for Approval

See Approval Request in LAR Attachment L for use of adjustable fog nozzles outside of high voltage electrical areas in order to enable trained fire brigade members to best fit the manual suppression response to the hazard encountered in a fire scenario.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- DB-FP-04005, Rev. 14, "Fire Brigade Equipment Monthly Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

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 firefighting 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.

Note: This exception is not endorsed by the NRC. See 10CFR50.48(c)(2)(v)

Compliance Basis:

Complies by Previous Approval

NRC letter dated May 30, 1991 (Log 3480) states, "As part of its comparison of the design of the standpipe and hose system to NRC fire protection guidelines and the criteria contained in NFPA Standard No. 14, the licensee identified several deviations in its letters dated January 6, 1988 and July 31, 1989. Several of these deviations pertain to the use of unlisted equipment, use of materials which do not meet the construction specifications of this standard, and the nature of the acceptance testing. The staff reviewed these deviations, including the licensee's justification and concludes that these conditions will not adversely affect system performance and are, therefore, acceptable based on the continuing acceptable performance of these system"

The May 30, 1991 letter concludes, "Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

NRC issued notice of final rule (RIN 3150-AG48) in Federal Register, Volume 69, No.115, dated June 16, 2004 regarding Voluntary Fire Protection Requirements for Light Water Reactors; Adoption of NFPA 805 as a Risk-Informed, Performance-Based Alternative. With respect to seismic standpipes and hose stations under comment resolution, the RIN states: "A commenter noted that Appendix A to BTP APCSB 9.5-1 did not require seismically qualified standpipes and hose stations for operating plants and plants with construction permits issued prior to July 1, 1976. NRC agrees that Appendix A to BTP APCSB 9.5-1 made separate provisions for operating plants and plants with construction permits issued prior to July 1, 1976, and did not require seismically qualified standpipes and hose stations for those plants. Therefore, the requirement in Section 3.6.4 of NFPA 805 is not applicable to licensees with nonseismic standpipes and hose stations previously approved in accordance with Appendix A to BTP APCSB 9.5-1."

At the time of original construction, Davis-Besse was not required to design the installation of its fire suppression and standpipe hose systems to be seismically

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

qualified: therefore, the requirements of Section 3.6.4 of NFPA 805 are not applicable.

The technical basis for approval still applies, remains valid, and is consistent with the plant configuration.

Davis-Besse complies by previous approval with the provisions of NFPA 805 based on the Safety Evaluation of May 30, 1991.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- DB-FP-00009, Rev. 20, "Fire Protection Impairment and Fire Watch"
- USAR, Rev. 0 7/82, "Update Safety Analysis Report"
- DB-OP-06610, Rev. 33, "Station Fire Suppression Water System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - N/A

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.

Compliance Basis:

Inside containment, there are three (3) fire hose type connections and valves which are supplied by the Service Water System. These connections are not considered part of the fire protection water standpipe system. The pre-fire plans for containment instruct the fire brigade to use fire hose connections located outside containment, which are supplied from the fire suppression system.

Davis-Besse is not committed to having a seismic designed standpipe system; therefore, NFPA section 3.6.5 is not applicable.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-041C, Rev. 47, "Service Water System for Containment Air Coolers"

Open Items and VFDRs

-None

3.7 Fire Extinguishers

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies by Previous NRC Approval

3.7

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.

Compliance Basis:

Complies by Previous Approval

The NFPA 10 Requirement Matrix in Serial No. 1685, Attachment 6 documents location, hazard, extinguisher type, and compliance for Davis-Besse.

Previous NRC approval is documented in Log No. 3480 which states: "The licensee identified several deviations from the criteria delineated in NFPA Standard No. 10 which applies to portable fire extinguishers. The principal deviations pertain to the spacing and accessibility of fire extinguishers…the staff conducted a walkdown of certain areas in the turbine and auxiliary buildings where deviations had been identified by the licensee. The staff observed that all of the locations audited had been provided with a sufficient number of extinguishers of the proper type even though the type and placement of the fire extinguishers are not in strict compliance with the applicable NFPA Code. On the basis of this sample of fire areas, plus the licensee's justification, the staff concludes that the number, type and placement of fire extinguishers in the plant is acceptable."

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies by Previous NRC Approval
- Complies with use of EEEE

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

Compliance Basis:

Complies by Previous Approval

Fire detection, alarm and signaling systems at Davis-Besse were evaluated for compliance with NFPA 72D and 72E submitted to the NRC in Serial No. 1685, dated July 31, 1989.

Previous NRC approval is documented in Log No. 3480 (ML033490026) which states: "The staff requested information from the licensee regarding the design of the fire detection, alarm and signaling system with respect to the criteria contained in NFPA Standard Nos. 72D and 72E. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Complies with use of EEEE

The fire detection, alarm and signaling system, installed by MOD 91-0046, was evaluated for compliance with NFPA 72-1990 and documented in NPE-98-00088. This review supersedes the NFPA 72D-1975 Summary Compliance Report documented in Serial No. 1685.

Licensing Actions
- None

Supporting EEEEs
- NPE-98-00088

3.8 Fire Alarm and Detection Systems

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- SD-036B, Rev. 2, "System Description for Fire Detection System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- NPE-98-00088, Rev. 3-20-98, "Davis Besse Nuclear Power Station NFPA Code Review Summary Compliance Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

The Public Address (Gai-Tronics) System provides handset/amplifier stations located throughout the plant. Additionally, the station telephones are located in various locations in the plant. A person observing a fire at any location in the plant can quickly access a Gai-Tronics handset station or a telephone and reliably communicate with the control room.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-035, Rev. 3, "Communication Systems"
- FEN-PAT, Rev. 10, "Plant Access Training"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Complies

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.

Compliance Basis:

The Communication Systems at Davis-Besse provides the means to promptly notify the general site population in all occupied areas via the Public Address (Gai-Tronics) system with audible alarms throughout the protected area and visual alarms in areas with high ambient noise; the means to notify members of the Fire Brigade and other groups supporting fire emergency response via the UHF Radio System; and two independent means to notify necessary off site emergency services required in any fire emergency via the Commercial Telephone System and the UHF Station Repeater. The notifications are in such a way to allow those notified to determine an appropriate course of action.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- SD-035, Rev. 3, "Communication Systems"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.8.2

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.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

3.9 Automatic and Manual Water-Based Fire Suppression Systems

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.9.2

Each system shall be equipped with a water flow alarm.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.9.3

All alarms from fire suppression systems shall annunciate in the control room or other suitable constantly attended location.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions | **Supporting EEEEs**

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - Submit for NRC Approval

3.9.4

Diesel-driven fire pumps shall be protected by automatic sprinklers.

Compliance Basis:

The room containing the diesel fire pump is provided with a wet-pipe sprinkler system, which uses fusible sprinklers. Actuation is accomplished by manually opening the isolation valve located outside of the pump room in the intake structure.

See Approval Request in LAR Attachment L for the diesel pump configuration not including automatic sprinklers. A redundant electric pump ensures fire flow availability. In addition, the diesel pump is protected by fire barriers, fire detection, supported by a trained fire brigade and manual suppression.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.9.5

Each system shall be equipped with an OS&Y gate valve or other approved shutoff valve.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.10.2

Operation of gaseous fire suppression systems shall annunciate and alarm in the control room or other constantly attended location identified.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.10.5

Provisions for locally disarming automatic gaseous suppression systems shall be secured and under strict administrative control.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.10.6

Total flooding carbon dioxide systems shall not be used in normally occupied areas.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.10.8

Positive mechanical means shall be provided to lockout total flooding carbon dioxide systems during work in the protected space.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.10.10

Particular attention shall be given to corrosive characteristics of agent decomposition products on safety systems.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement: - N/A

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.

Compliance Basis:

This is a general statement section with no specific requirements. Refer to the following NFPA subsections 3.11.1 through 3.11.4 for the specific requirements. Compliance for each of the subsections is evaluated for each compartment in the fire protection features section and/or in this Chapter 3 review.

Licensing Actions

- None

Supporting EEEEs

- No Evaluations

References

- None

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Complies by Previous NRC Approval
- Will Comply with the Use of Commitment

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.

Compliance Basis:

Complies:

Buildings are designated as having a 3 hour fire rating or are spatially separated. The separation of the structures in the power block at Davis-Besse meets the criteria of NFPA 805 section 3.11.1.

The fire barrier separation between adjacent Fire Compartments uses a performance-based approach in accordance with NFPA 805 sections 3.11.1 and 4.2.4. An integrated assessment of the acceptability of risk, defense-in-depth, and safety margins has been performed and the adequacy of the separation between these compartments is documented in the Substantial Barrier Analysis included in the Plant Partitioning Calculation C-FP-013.10-007, the Multi-Compartment Analysis report and the Fire PRA.

Complies by Previous NRC Approval

The NRC exemption acceptance for the separation of redundant trains installed in embedded conduit is in correspondence Log No. 3219, dated April 18, 1990 (ML021190569) and states:

"Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage."

Will Comply with the Use of Commitment

Performance based fire barriers and components will be reviewed for inclusion into NFPA 805 fire barrier inspection procedures. See DB-0573.

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.11 Passive Fire Protection Features

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- No Evaluations

References

- Serial No. 991, "Topic: Appendix R Exemption Requests, September 30, 1983"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- "PRA Notebook 10-05: Fire Risk Quantification, Rev 0."
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-066, Rev. 0, "NFPA 805 Task 5.11 Multi-Compartment Analysis"

Open Items and VFDRs

Item Number	DB-0573	**Item Title:** 3.2.3(1) – Review Performance-Based Inspection Requirements to include NFPA 805 credited fire protection equipment

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.11.2

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.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

3.11.3

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 3.11.3.4 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 System
(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.

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Compliance Statement:
- Complies
- Complies with use of EEEE

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.

Compliance Basis:

Complies

Penetrations are sealed by procedure to details and tested configurations that meet the applicable requirements capable of maintaining the fire resistance rating of the barrier.

The assessment of this subsection is documented in individual compartment-specific records, as required, in LAR Attachment A, NEI 04-02 Table B-1 Transition of Fundamental Fire Protection Program and Design Elements, Davis-Besse Nuclear Power Station, Attachment A2 Records.

Complies with Use of EEEE

Where penetration seals do not meet typical configurations, an evaluation was performed, per the guidance in NRC Generic Letter 86-10, to demonstrate the acceptability of the fire barrier penetration seal.

Licensing Actions	**Supporting EEEEs**
- None	- C-FP-013.06-045

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

Non-Fire Compartment Specific

Transition Report

Davis-Besse

3.11 Passive Fire Protection Features

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- 3614-2-E-14Q, Rev. 0, "Nuclear Engineering and Const. Spec."
- EXT-88-02422, Rev. 0, "Wisconsin Test of Internal Conduit Seals"
- C-1595, Rev. 10, "Penetration Schedule"
- Log No. 2171, "Fire Test Reports on Penetration Seals - Satus of Evaluation"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- EXT-94-01527, Rev. 0, "Perry Nuclear Plant Fire Test Report"
- VTI-600869134-015, "Task 1.2 - chapter 3 Fire Area Specific Fire Protection Features Review"
- Serial No. 1352, "Fire Barrier Penetration Seals"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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 86-1 0, 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 86-1 0, Supplement l, are acceptable providing that the system successfully met the limiting endpoint temperature requirements as specified by the AHJ at the time of acceptance."

Compliance Basis:

The assessment of this subsection is documented, as required, in a separate report titled:
"Table B-1 - Transition of Fundamental Fire Protection Program and Design Elements Worksheet Fire Compartment Specific"

Licensing Actions

Supporting EEEEs

References

Open Items and VFDRs

-None

Davis-Besse Nuclear Power Station, Attachment A2 Records

543 Pages Attached

Transition Report Attachment

Davis-Besse

A - NEI 04-02 Table B-1 Transition of Fundamental FP Program Requirements and Design Elements

Transition Report Section: **- Attachments**

Transition Report Subsection: **A - NEI 04-02 Table B-1 Transition of Fundamental FP Program Requirements and Design Elements**

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-01 consists of the following Rooms: 102, 103, 104, 104A, 106, 106A, 107, 108, 109, 109A, and 111 located on elevations 545’ through 585' of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

The door penetrating the fire barrier is designed and installed in accordance with NFPA 252 and NFPA 80, and is listed as a fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101. The fire door is inspected periodically and maintained per procedures. There are no fire dampers penetrating the fire barriers.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The non-rated hatches in the ceiling and the inaccessible damper in this fire compartment were evaluated and found to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-040
C-FP-013.06-119
FCR 86-0220A Attachment

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-87, Rev. 62, "Architectural Door Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04024, Rev. 9, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-413, Rev. 19, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 565'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-036

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - A-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire compartment A-02 contains automatic fire detectors credited for Rooms 110, 110A, and 117A. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May, 30, 1991 [Log 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection...with respect to the criteria contained in NFPA Standard No...72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant...The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-015
C-FP-013.06-055
C-FP-013.06-059
C-FP-013.06-083

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""

- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 7, Rev. 6, "Raceway - Fire Alarm System Auxiliary Building Plan EL. 545"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-02 consists of the following Rooms: 110 (Passage), 110A (Passage), 112 (Decontamination Area), 116 (Misc. Waste Evaporation Room), 117 (Waste Evaporation Storage Tank/Pump Room), 117A (Condensate Tank and Pump Room), 119 (Degassifier Room), 120 (Valve Room), 121 (waste Gas Storage Tank Room) and 122 (Valve Access Room) located on elevations 545' and 555' of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance. .

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An evaluation has been performed on an unrated hatch in the ceiling of this fire compartment and finds the current configuration provides an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-059

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration Seals were confirmed to be inspected periodically by administrative procedures and maintenance-preventative tasks.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Penetrations that were not of tested configurations were evaluated and found to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-015
C-FP-013.06-055
C-FP-013.06-083
C-FP-013.06-093

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-03

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-03 consists of Room 114, Misc. Waste Monitoring Tank Room, located on the 545' elevation of the Auxiliary Building. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An evaluation demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-100, Rev. 5, "Shield Building Foundation Plan & Details Sh. 1"
- C-201, Rev. 39, "Auxiliary Building Foundation Plan El. 545'-0" Sh. 2"
- C-215, Rev. 11, "Auxiliary Building Sections & Details Sh. 28"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - A-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80, and are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101. There are no fire dampers penetrating the fire barriers.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - A-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration Seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - A-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: ERFBS

SubSection: 3.11.5 - ERFBS

Compliance Basis:

Fire Compartment A-03 consists of Room 114, Misc. Waste Monitoring Tank Room. Room 114 contains credited ERFBS for several raceways. Each ERFBS has been tested in accordance with, and meets 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 required in A-03 is inspected periodically per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- C-FP-013.06-106, Rev. 0, "Generic Technical Evaluation for 3M Fire Barrier for Three Hour Designs"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-286-AQ, Rev. 1, "Technical Specification for Operational Phase for Procurement and Installation of Fire Barrier Systems"
- E-899A, Sht. 11, Rev. 1, "Equipment/Raceway Fire Protective Coating or Wrapping"
- C-FP-013.06-107, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 114"
- DB-FP-04021, Rev. 7, "Periodic Test Procedure Appendix R Fire Wrap Visual Inspection"
- E-286AQ-17-3, Sht. 1, Rev. 3, "Conduit Detail 3M Interam 3 Hour Fire Rated Wrap"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-04

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment A-04 contains automatic fire detectors credited for Room 115, ECCS Pump Room 1-2. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May, 30 1991 [Log 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant...The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 7, Rev. 6, "Raceway - Fire Alarm System Auxiliary Building Plan El 545'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-04

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-04 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119, and that are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-04

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire doors are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101. Fire doors are inspected periodically and maintained per procedures. There are no fire dampers associated with this fire compartment.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-414, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 545'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - A-04

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-05

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment A-05 contains automatic fire detectors credited for Room 124, the Clean Waste Receiver Tank Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May, 30, 1991 [Log 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant...The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-003

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 6, Rev. 9, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 565"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - A-05

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment A-05 consists of Rooms 123, 124, 125, and 126. Room 124, Clean Waste Receiver Tank Room, is provided with an automatic wet-pipe sprinkler system. Room 124 also is provided with a water spray curtain system that protects the non-rated wall panels between Room 235, the Boric Acid Evaporator Room 1-1 (in Fire Compartment G-02), and both Rooms 236 (in Fire Compartment A-07) and 124 (in Fire Compartment A-05). This water spray system is evaluated in the 3.9.1 Record for Fire Compartment G-02.

Complies

The wet-pipe sprinkler system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989. The staff also requested that the licensee provide justification that a proposed modification, delineated in the NFPA code comparison, would conform with the criteria in Section 2-1.2 of NFPA Standard No. 15. The licensee stated in

the letter cited above that the modification, which involves adding batteries with a charging system to the fire water spray release control system, will be in accordance with the relevant sections of NFPA 15. The licensee indicated in a telephone conference on February 26, 1991, that this commitment has been implemented."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-003

NPE-98-00081

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Modification 89-0079, "Appendix R Sprinkler System Upgrade"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-351, Rev. 1, "Fire Protection Piping, Sprinkler System Room 124, Auxiliary Building Elev. 545'-0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

Each system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with each system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04017, Rev. 8, "18 Month RRA Deluge Sprinkler Functional Test"
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

Each system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-351, Rev. 1, "Fire Protection Piping, Sprinkler System Room 124, Auxiliary Building Elev. 545'-0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- M-269M, Rev. 1, "Fire Protection System, Water Curtain-Rm 235, Auxiliary Bldg. - Elev 565'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - A-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for these systems meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- M-269M, Rev. 1, "Fire Protection System, Water Curtain-Rm 235, Auxiliary Bldg. - Elev 565'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- OS-047B, Sht. 4, Rev. 20, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-05

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-05 consists of Rooms 123 (Clean Waste Receiver Tank), 124 (Clean Waste Receiver Tank), 125 (Detergent Waste Drain Tank), and 126 (Misc. Waste Tank) of the Auxiliary Building located at the 545 ft. elevation of the Auxiliary Building. The barriers adjacent to other fire compartments are concrete, and exceed the minimum concrete slab thickness needed to endure a 3 hour fire rating per the ASTM E119 time-temperature curve per Figure 4-10.6 of the SFPE Handbook, 3rd Edition.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Part of the barrier between Rooms 124 and 235 has an opening that is protected by a water curtain. This has been evaluated and found to provide an acceptable level of protection.

An evaluation demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-003
C-FP-013.06-122
NPE-98-00081

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-05

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Penetrations that were not of tested configurations were evaluated and found to provide an acceptable level of protection.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-024

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - A-06

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment A-06 contains partial area automatic fire detectors credited for Room 127E, Containment Annulus (East). The detectors are inaccessible during power operation. They are installed, located, maintained, and tested during refueling outages in accordance with NFPA 72E.

Fire Compartment A-06 partial area coverage fire detectors provide adequate protection for the electrical penetration area and meet the performance requirements as analyzed in NFPA 805 Section 4.2.4. Fire detector testing is performed on a refueling frequency due to limited accessibility during power operation.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27 1987; May 23 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047
C-FP-013.06-048

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-MI-04825, Rev. 4, "Critical Periodic Test Procedure Functional Test of Inaccessible Detectors for Node 5 C2720"
- E-0892, Sht. 9, Rev. 2, "Raceway Fire Alarm System Shield Building - Annulus Plan & Section"

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- NPE-98-00088, Rev. 3-20-98, "Davis Besse Nuclear Power Station NFPA Code Review Summary Compliance Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-06

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-06 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-048
C-FP-013.06-122

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - A-06

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

This fire compartment has no fire dampers between it and adjacent fire compartments.

The fire doors installed in the barrier separating this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-87, Rev. 62, "Architectural Door Schedule"
- A-88, Rev. 52, "Architectural Door Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 0, "Project Procedure P1957-022-001, Revision 0, Davis-Besse Post-Fire Safe Shutdown and PRA Systems and Component Selection"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - A-06

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs or a performance-based approach.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Penetrations that were not of tested configurations were evaluated and found to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-046
C-FP-013.06-047

References

- 3614-2-E-14Q, Rev. 0, "Nuclear Engineering and Const. Spec."
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-06

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: ERFBS

SubSection: 3.11.5 - ERFBS

Compliance Basis:

Fire Compartment A-06 consists of Room 127E, Containment Annulus East. Room 127E contains credited ERFBS for several raceways. Each ERFBS has been tested in accordance with, and meets 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 required in A-06 is inspected periodically per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- C-FP-013.06-106, Rev. 0, "Generic Technical Evaluation for 3M Fire Barrier for Three Hour Designs"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-286AQ-12-3, Sht. 2, Rev. 3, "Electrical Penetration Assembly P1P3B, 3M Interam 3 Hour Fire Wrap"
- E-286AQ-12-3, Sht. 4, Rev. 3, "Electrical Penetration Assembly P1P3B, 3M Interam 3 Hour Fire Wrap"
- E-286AQ-13-2, Sht. 3, Rev. 2, "Electrical Penetration Assembly PBL4E, 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-13-3, Sht. 2, Rev. 3, "Electrical Penetration Assembly PBL4E, 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-14-2, Sht. 3, Rev. 2, "Electrical Penetration Assembly P2C5G, 3M Interam 3 Hour Fire Wrap"
- E-286AQ-14-3, Sht. 2, Rev. 3, "Electrical Penetration Assembly P2C5G, 3M Interam 3 Hour Fire Wrap"
- E-899A, Sht. 10, Rev. 2, "Equipment/Raceway Fire Protective Coating or Wrapping"
- C-FP-013.06-108, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 127"
- DB-FP-04021, Rev. 7, "Periodic Test Procedure Appendix R Fire Wrap Visual Inspection"
- E-286AQ-12-3, Sht. 3, Rev. 3, "Electrical Penetration Assembly P1P3B, 3M Interam 3 Hour Fire Wrap"
- E-286AQ-12-4, Sht. 1, Rev. 4, "Electrical Penetration Assembly P1P3B, 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-13-3, Sht. 1, Rev. 3, "Electrical Penetration Assembly PBL4E, 3M Interam 3 Hour Fire Wrap"
- E-286AQ-13-3, Sht. 4, Rev. 3, "Electrical Penetration Assembly PBL4E, 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-14-3, Sht. 1, Rev. 3, "Electrical Penetration Assembly P2C5G, 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-14-3, Sht. 4, Rev. 3, "Electrical Penetration Assembly P2C5G, 3M Interam 3 Hour Fire Wrap"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-07

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment A-07 contains automatic fire detectors credited for Room 236. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-005
C-FP-013.06-114

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""

- E-892, Sht. 6, Rev. 9, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 565"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - A-07

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment A-07 consists of Room 236, No. 2 Mechanical Penetration Room. Room 236 is provided with an automatic wet-pipe sprinkler system. Room 236 also is provided with a water spray curtain system that protects the non-rated wall panels between Room 235, the Boric Acid Evaporator Room 1-1 (in Fire Compartment G-02), and both Rooms 236 (in Fire Compartment A-07) and 124 (in Fire Compartment A-05). This water spray system is evaluated in the 3.9.1 Record for Fire Compartment G-02.

Complies

The wet-pipe sprinkler system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989. The staff also requested that the licensee provide justification that a proposed modification, delineated in the NFPA code comparison, would conform with the criteria in Section 2-1.2 of NFPA Standard No. 15. The licensee stated in

the letter cited above that the modification, which involves adding batteries with a charging system to the fire water spray release control system, will be in accordance with the relevant sections of NFPA 15. The licensee indicated in a telephone conference on February 26, 1991, that this commitment has been implemented.”

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-005
C-FP-013.06-031
C-FP-013.06-114
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-353, Rev. 1, "Fire Protection Piping, Sprinkler System Room 236, Auxiliary Building Elev. 565'-0""
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

Each system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with these systems annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04017, Rev. 8, "18 Month RRA Deluge Sprinkler Functional Test"
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

Each system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-353, Rev. 1, "Fire Protection Piping, Sprinkler System Room 236, Auxiliary Building Elev. 565'-0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- M-269M, Rev. 1, "Fire Protection System, Water Curtain-Rm 235, Auxiliary Bldg. - Elev 565'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

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

Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for these systems meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- M-269M, Rev. 1, "Fire Protection System, Water Curtain-Rm 235, Auxiliary Bldg. - Elev 565'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- OS-047B, Sht. 4, Rev. 20, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-07

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-07 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

The barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Complies by Previous Approval

Overhead sprinklers have been provided in rooms where structural steel could not be adequately fireproofed. The NRC has reviewed this alternative method and found the changes to be acceptable. NRC letter dated July 17, 1980 states:

“The affected areas are rooms 208, 236 (No. 2 Mechanical Penetration Room), 303, 402, 405, and 427. The alternative you have proposed is to install overhead sprinkler systems in these rooms rather than to apply the fireproof coatings.

We find that the alternative method which you have proposed for the above rooms will provide the protection that we intended in the Davis-Besse Fire Protection Safety Evaluation Report dated July 26, 1979. The changes are therefore acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

References

- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- Log No. 582, "NRC Letter of July 17, 1980"
- DB-FP-04023, Rev. 15, "Fire Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - A-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. No fire dampers associated with this area. Fire door 205 is a listed fire-rated assembly consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 80 and NFPA 101. Fire door 205 is inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-07

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Penetrations that were not of tested configurations are evaluated in EEEEs and found to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-031
C-FP-013.06-047
C-FP-013.06-114

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - A-08

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment A-08 contains automatic fire detectors credited for Room 314. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May, 30 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-034
C-FP-013.06-115

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- DB-MI-04816, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 6 C3720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Modification 88-0161, "Fire Detection Upgrades"

Open Items and VFDRs

-None

Fire Compartment - A-08

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment A-08 consists of Room 314, No. 4 Mechanical Penetration Room. Room 314 is provided with a credited automatic wet-pipe sprinkler system. Room 314 also is provided with a credited water spray curtain system, actuated by fire detectors, that protects the non-rated wall panels between Room 314 and Room 326 (in Fire Compartment II-01).

Complies

The wet-pipe sprinkler system satisfies the NFPA 13 code requirements, and the water spray system satisfies the NFPA 15 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989. The staff also requested that the licensee provide justification that a proposed modification, delineated in the NFPA code comparison, would conform with the criteria in Section 2-1.2 of NFPA Standard No. 15. The licensee stated in the letter cited above that the modification, which involves adding batteries with a charging system to the fire water spray release control system, will be in accordance with the relevant sections of NFPA 15. The licensee indicated in a telephone conference on February 26, 1991, that this commitment has been implemented."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-031
C-FP-013.06-033
C-FP-013.06-034
C-FP-013.06-050
C-FP-013.06-091
C-FP-013.06-092
C-FP-013.06-115
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04017, Rev. 8, "18 Month RRA Deluge Sprinkler Functional Test"
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- M-269F, Rev. 1, "Fire Protection System, Water Curtain - Room 314, Auxiliary & Turbine Bldg's Elev. 585'-0""
- M-356, Rev. 1, "Fire Protection Piping, Sprinkler System Room 314, Auxiliary Building Elev. 585'-0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

Fire Compartment - A-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

Each system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - A-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with these systems annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04017, Rev. 8, "18 Month RRA Deluge Sprinkler Functional Test"
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

Each system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-356, Rev. 1, "Fire Protection Piping, Sprinkler System Room 314, Auxiliary Building Elev. 585'-0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- M-269F, Rev. 1, "Fire Protection System, Water Curtain - Room 314, Auxiliary & Turbine Bldg's Elev. 585'-0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for these systems meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- OS-047B, Sht. 4, Rev. 20, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-08

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-08 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies by Previous Approval

NRC letter dated April 18, 1990 (ML0211905569), Log 3219, states: "Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage."

Complies with use of EEEE

A gap in in the barrier and blowout panels installed in the barrier has been evaluated and found to be adequate.

The structural steel fire proofing throughout the plant that deviates from UL Listed configurations was evaluated as adequate.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions	**Supporting EEEEs**
- None	C-FP-013.06-050
	C-FP-013.06-115
	C-FP-013.06-122

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Licensing Actions

Supporting EEEEs

NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-08

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating rated fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire doors are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101. Fire doors in fire-rated barriers are inspected periodically and maintained per procedures. There are no fire dampers associated with this fire compartment.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The four duct openings and the 42" exhaust purge opening without fire dampers was evaluated to be acceptable.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-033
C-FP-013.06-034

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-08

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Penetrations that were not of tested configurations were evaluated in EEEEs and found to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-033
C-FP-013.06-034
C-FP-013.06-050
C-FP-013.06-091
C-FP-013.06-092
C-FP-013.06-115

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: ERFBS

SubSection: 3.11.5 - ERFBS

Compliance Basis:

Fire Compartment A-08 consists of Room 314, the No. 4 Mechanical Penetration Room. Room 314 contains credited ERFBS for several raceways. Each ERFBS has been tested in accordance with, and meets 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 required in A-08 is inspected periodically per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- C-FP-013.06-103, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 314"
- C-FP-013.06-110, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 314"
- DB-FP-04021, Rev. 7, "Periodic Test Procedure Appendix R Fire Wrap Visual Inspection"
- E-286AQ-11-3, Sht. 2, Rev. 3, "Conduit Detail 3M Interam 1 Hour Fire Rated Wrap"
- E-286AQ-15-2, Sht. 2, Rev. 2, "Boxes PIP3BX, IPGS01, IPGS02 & Conduits 46097A & 46098A – 1 HR."
- E-286AQ-15-3, Sht. 3, Rev. 3, "Boxes PIP3BX, IPGS01, IPGS02 & Conduits 46097A & 46098A – 1 HR."
- E-286AQ-15-3, Sht. 5, Rev. 3, "Boxes PIP3BX, IPGS01, IPGS02 & Conduits 46097A & 46098A – 1 HR."
- E-899A, Sht. 13, Rev. 2, "Equipment/Raceway Fire Protective Coating or Wrapping"
- C-FP-013.06-105, Rev. 0, "Generic Technical Evaluation for 3M Fire Barrier for One Hour Designs"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-286AQ-11-3, Sht. 1, Rev. 3, "Conduit Detail 3M Interam 1 Hour Fire Rated Wrap"
- E-286AQ-15-2, Sht. 1, Rev. 2, "Boxes PIP3BX, IPGS01, IPGS02 & Conduits 46097A & 46098A – 1 HR."
- E-286AQ-15-2, Sht. 6, Rev. 2, "Boxes PIP3BX, IPGS01, IPGS02 & Conduits 46097A & 46098A – 1 HR"
- E-286AQ-15-3, Sht. 4, Rev. 3, "Boxes PIP3BX, IPGS01, IPGS02 & Conduits 46097A & 46098A – 1 HR."
- E-899A, Sht. 12, Rev. 2, "Equipment/Raceway Fire Protective Coating or Wrapping"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-09

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment A-09 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An evaluation demonstrates the adequacy of the structural steel fire proofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - A-09

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

There are no fire dampers associated to this fire compartment.

The fire door, which is part of the barrier separation between this and adjacent fire compartments, uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - A-09

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment AB-01 contains automatic fire detectors credited for Rooms 105, 113, and 113A. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-015
C-FP-013.06-020

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 7, Rev. 6, "Raceway - Fire Alarm System Auxiliary Building Plan El 545'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment AB-01 consists of Rooms 105 (ECCS Pump Room 1-1), 113 (Decay Heat Cooler Room), and 113A (Hatch Area) of the Auxiliary Building located at the 545' and 555' elevations. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Evaluations demonstrate the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-096
C-FP-013.06-122
NPE-98-00081

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The non-rated hatch opening in the barrier between Rooms 227 and 113/113A has been evaluated as acceptable.

The HVAC duct between Room 105 and stairwell AB3 fire barrier does not have a fire damper and was evaluated as acceptable.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-020
C-FP-013.06-063

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-415, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Sections & Details"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-414, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 545'-0""
- M-467, Rev. 15, "Fire Damper Schedule"

References

- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - AB-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Penetrations that were not of tested configurations were evaluated in EEEEs and found to provide an acceptable level of protection.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-015
C-FP-013.06-062
C-FP-013.06-070

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - AB-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment AB-02 contains partial area automatic fire detectors credited for Room 127W, Annulus Space (West). The detectors are inaccessible during power operation. They are located, maintained, and tested during refueling outages in accordance with NFPA 72E.

Fire Compartment AB-02 partial area coverage fire detectors provide adequate protection for the electrical penetration area and meet the performance requirements as analyzed in NFPA 805 Section 4.2.4. Fire detector testing is performed on a refueling frequency due to limited accessibility during power operation.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047
C-FP-013.06-048

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- DB-MI-04825, Rev. 4, "Critical Periodic Test Procedure Functional Test of Inaccessible Detectors for Node 5 C2720"
- E-0892, Sht. 9, Rev. 2, "Raceway Fire Alarm System Shield Building - Annulus Plan & Section"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- Modification 88-0161, "Fire Detection Upgrades"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment AB-02 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-048
C-FP-013.06-122

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

This fire compartment has no fire dampers between it and adjacent fire compartments.

The fire doors installed the barrier separating this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - AB-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Penetrations that were not of tested configurations were evaluated in EEEEs and found to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-046
C-FP-013.06-047
C-FP-013.06-048

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - AB-03

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment AB-03 contains automatic fire detectors credited for Rooms 202 and 208. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- E-892, Sht. 6, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 565'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - AB-03

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment AB-03 consists of Room 208, No. 1 Mechanical Penetration Room, Room 208DC, Duct Chase, and Room 202, Pipeway Area. Rooms 208 and 202 are provided with an automatic wet-pipe sprinkler system.

Complies

This system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989.

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection

program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-352, Rev. 1, "Fire Protection Piping, Sprinkler System Room 208, Auxiliary Building Elev 565'0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- M-352, Rev. 1, "Fire Protection Piping, Sprinkler System Room 208, Auxiliary Building Elev 565'0""
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Fire Compartment - AB-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-352, Rev. 1, "Fire Protection Piping, Sprinkler System Room 208, Auxiliary Building Elev 565'0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

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

Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-03

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment AB-03 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies by Previous NRC Approval

The supporting excerpt from Log 582 from the NRC Division of Licensing dated July 17, 1980, is as follows:

"By letter dated May 15, 1980, you submitted a revision to the.Davis-Besse Unit No. 1 Fire Hazards Analysis Report. The revision describes proposed changes to the fire protection methods for several rooms in which the fireproof coatings to be applied to structural steel, as called for in the original plan, could not be effectively installed. The affected areas are rooms 208, 236, 303, 402, 405, and 427. The alternative you have proposed is to install overhead sprinkler systems in these rooms rather than to apply the fireproof coatings.

We find that the alternative method which you have proposed for the above rooms ·Will provide the protection that we intended in the Davis-Besse Fire Protection Safety Evaluation Report dated July 26, 1979. The changes are therefore acceptable."

Complies with use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 582, "NRC Letter of July 17, 1980"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - AB-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-413, Rev. 19, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 565'-0""
- M-414, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 545'-0""
- M-415, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Sections & Details"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements — **Davis-Besse**

Fire Compartment - AB-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-04

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment AB-04 contains automatic fire detectors credited for Room 225, Makeup Pump Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- E-892, Sht. 6, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 565'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - AB-04

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment AB-04 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Evaluations demonstrate the adequacy of the structural steel fire proofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-097
C-FP-013.06-122
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-04

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

There are no HVAC at interfaces with adjacent fire compartments requiring fire dampers for this fire compartment.

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80, and they are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101. Fire doors are inspected periodically and maintained per procedures. There are no fire dampers penetrating the fire barriers.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-413, Rev. 19, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 565'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-04

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-05

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment AB-05 contains automatic fire detectors credited for Room 303. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04816, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 6 C3720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - AB-05

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment AB-05 consists of Room 303, No. 3 Mechanical Penetration Room, and Room 303PC, Pipe Chase. Room 303 is provided with an automatic wet-pipe sprinkler system.

Complies

This system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989. "

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection

program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-039
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-354, Rev. 1, "Fire Protection Piping, Sprinkler System Room 303, Auxiliary Building Elev 585'0""
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Fire Compartment - AB-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-354, Rev. 1, "Fire Protection Piping, Sprinkler System Room 303, Auxiliary Building Elev 585'0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - AB-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - AB-05

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment AB-05 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies by Previous NRC Approval

Overhead sprinklers have been provided in rooms where structural steel could not be adequately fireproofed. The NRC has reviewed this alternative method and found the changes to be acceptable.

The supporting excerpt from Log 582 from the NRC Division of Licensing dated July 17, 1980, is as follows:

"By letter dated May 15, 1980, you submitted a revision to the.Davis-Besse Unit No. 1 Fire Hazards Analysis Report. The revision describes proposed changes to the fire protection methods for several rooms in which the fireproof coatings to be applied to structural steel, as called for in the original plan, could not be effectively installed. The affected areas are rooms 208, 236, 303, 402, 405, and 427. The alternative you have proposed is to install overhead sprinkler systems in these rooms rather than to apply the fireproof coatings.

We find that the alternative method which you have proposed for the above rooms ·Will provide the protection that we intended in the Davis-Besse Fire Protection Safety Evaluation Report dated July 26, 1979. The changes are therefore acceptable."

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions	Supporting EEEEs
- None	C-FP-013.06-122
	NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Log No. 582, "NRC Letter of July 17, 1980"
- Serial No. 617, "May 15, 1979 Tol. Ed. Letter to NRC"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-05

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire doors are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101. Fire doors are inspected periodically and maintained per procedures. There are no fire dampers associated with this fire compartment.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An engineering evaluation concluded it was acceptable not to have a fire damper where the Containment Purge Supply Duct penetrates the floor of Room 500.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-039

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Fire Compartment AB-05 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119 and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- 3614-2-E-14Q, Rev. 0, "Nuclear Engineering and Const. Spec."
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-06

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire compartment AB-06 consists of Room AB-3, Auxiliary Building Stairwell. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119.
The majority of fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-06

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

EEEE-type evaluations have been performed for a ventilation penetration with no fire damper and found the current construction adequate for the hazard.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-063

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-414, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 545'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-413, Rev. 19, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 565'-0""
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AB-06

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of a penetration evaluated by EEEEs.

Complies with use of EEEE

An EEEE provides justification for non-rated penetration.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-070

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AC-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment AC-01 consists of Room PT, BWST Pipe Trench, and Room PWST, PWST Trench, both located on the 565’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AC-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Entry into Fire Compartment AC-01 is from the outside through access hatches. These hatches are not penetrating a fire barrier and are not required to be fire rated. No dampers penetrate the fire barriers.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AC-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AD-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment AD-01 consists of Room 118 (elevator machinery room), AB-2 (east Aux Building stairwell), and EL-3 (Aux Building Elevator) of the Auxiliary Building located at the 545', 555', 565', 585', and 603' elevations. The barriers adjacent to other fire compartments are concrete and are either Appendix R and/or Appendix A fire barriers. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AD-01

Compliance Statement: Complies
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Will Comply with the Use of Commitment

Fire rated elevator doors will be included on a fire door schedule.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- A-88, Rev. 52, "Architectural Door Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-0452, Rev. 14, "Heating Ventilation & Air Conditioning Access Control Ceiling Space Plan"
- M-414, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 545'-0""
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

Item Number DB-0846 **Item Title:** Task 1.2; Modify Door Schedule Drawing to Include Stationary Elevator Doors

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - AD-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance-preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - B-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment B-01 consists of Room 100 (Equipment and Pipe Chase) and Room 101 (Pipe Tunnel), both located on the 545' elevation of the Auxiliary Building, and Room 100 extends through the 585’-0” elevation. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - B-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80, and they are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier. Fire doors are inspected periodically and maintained per procedures. There are no fire dampers penetrating the fire barriers.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-413, Rev. 19, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 565'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - B-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-062

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BD-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment BD-01 consists of Room 50, Screen Wash Pump Room, and Room 54, Stairway, located in the Intake Structure. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - BD-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80, and they are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101. Fire doors are inspected periodically and maintained per procedures. There are no fire dampers penetrating the fire barriers.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-87, Rev. 62, "Architectural Door Schedule"
- A-88, Rev. 52, "Architectural Door Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- A-88B, Rev. 7, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BD-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-011

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BE-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment BE-01 contains automatic fire detectors credited for Room 51, Diesel Fire Pump Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-008

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- E-892, Sht. 8, Rev. 4, "Raceway Fire Alarm System Intake Structure Plan El's 556'-0" & 576'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04812, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 2 C3080"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BE-01

Compliance Statement: Complies by Previous Approval
Submit for NRC Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment BE-01 consists of Room 51, Diesel Fire Pump Room, and Room 55, Diesel Fire Pump Tank Enclosure. Room 51 is provided with a manually-isolated sprinkler system.

Submit for NRC Approval

LAR Attachment L includes an exemption request from automatic to manual sprinkler coverage in the diesel fire pump Room BE-01.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components...As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas...During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable.”

Licensing Actions	Supporting EEEEs
- None	- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- DB-FP-04004, Rev. 14, "Periodic Test Procedure - 12 Month Valve Cycle"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-06601, Rev. 7, "Operations Procedure - Wet Pipe Sprinkler Systems"
- M-016A, Rev. 53, "P&ID, Station Fire Protection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - BE-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016A, Rev. 53, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BE-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

This system is provided with a water flow alarm that annunciates in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016A, Rev. 53, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BE-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

The sprinkler system is equipped with an approved shutoff valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016A, Rev. 53, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

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

Fire Protection Features

Transition Report

<u>**NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements**</u> **Davis-Besse**

Fire Compartment - BE-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

<u>**Licensing Actions**</u>

- None

<u>**Supporting EEEEs**</u>

- None

<u>**References**</u>

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016A, Rev. 53, "P&ID, Station Fire Protection System"

<u>**Open Items and VFDRs**</u>

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BE-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment BE-01 consists of Room 51 (Diesel Fire Pump Room) and Room 55 (Diesel Fire Pump Tank Enclosure) located on the 566' elevation of the Intake Structure. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An evaluation concluded a non-rated opening was acceptable.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-004
C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-412, Rev. 37, "Intake Structure Plan at Elev. 576'-0" & 585'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BE-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies
Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE
A non-rated opening is justified based on an EEEE.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-004

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BE-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-008
C-FP-013.06-011

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BF-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment BF-01 contains automatic fire detectors credited for Room 52. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.04-005
C-FP-013.06-004
C-FP-013.06-008
C-FP-013.06-060

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"

- E-892, Sht. 8, Rev. 4, "Raceway Fire Alarm System Intake Structure Plan El's 556'-0" & 576'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04812, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 2 C3080"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - BF-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment BF-01 consists of Room 52, Service Water Pump Area, and Room 52A, Service Water Fan Enclosure. Room 52 is provided with a credited automatic wet-pipe sprinkler system.

Complies

This system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection

program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-004
C-FP-013.06-008

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- M-363, Rev. 2, "Fire Protection Piping, Sprinkler Sys. S.W. Pump Rm 52, Intake Structure Elev 576'0""
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- Specification M-149F, Rev. 2, "Technical Specification for Operational Phase for Furnishing and Installation of Fire Protection Sprinkler and Water Spray Systems"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-342, Rev. 2, "Fire Protection Piping, Sprinkler Sys. SW Pump Rm 52, Intake Structure Elev 576'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - BF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016A, Rev. 53, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016A, Rev. 53, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Fire Compartment - BF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016A, Rev. 53, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-363, Rev. 2, "Fire Protection Piping, Sprinkler Sys. S.W. Pump Rm 52, Intake Structure Elev 576'0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - BF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016A, Rev. 53, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment BF-01 consists of Room 52, Service Water Pump Area, and Room 52A, Service Water Fan Enclosure, located in the Intake Structure. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An evaluation concluded a non-rated opening was acceptable.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-004
C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-412, Rev. 37, "Intake Structure Plan at Elev. 576'-0" & 585'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

A non-rated opening is justified based on an EEEE.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-004

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-460, Rev. 16, "Heating Ventilating & Air Conditioning Intake Structure - Diesel Fuel Oil Pump House Plans and Sections"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-004
C-FP-013.06-008
C-FP-013.06-060

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BG-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment BG-01 contains automatic fire detectors for Room 53, Service Water Valve Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-060

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- DB-MI-04812, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 2 C3080"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 8, Rev. 4, "Raceway Fire Alarm System Intake Structure Plan El's 556'-0" & 576'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BG-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment BG-01 consists of Rooms 53, 53A, 250, and 251, located on the 566' elevation of the Intake Structure. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements — **Davis-Besse**

Fire Compartment - BG-01

Compliance Statement: Complies
Complies with use of EEEE
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

EEEEs evaluate the adequacy for the hazard of a door and dampers penetrating the fire barrier.

Will Comply with the Use of Commitment

Will comply with the commitment to include the fire dampers installed within the fire door in the fire-rated barrier's inspection procedures.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-035
C-FP-013.06-061

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

Item Number DB-1912 **Item Title:** Include inspection of Fire Barriers in Inspection Procedure

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BG-01

Compliance Statement: Complies
Complies with use of EEEE
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

Several EEEEs provide justification for non-rated penetrations.

Will Comply with the Use of Commitment

C-FP-013.06-035 and C-FP-013.06-061 will be revised per open item DB-1825 in LAR Attachment S, so that their bases are acceptable for transition.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-025
C-FP-013.06-035
C-FP-013.06-060
C-FP-013.06-061

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

Item Number DB-1825 **Item Title:** DB EEEE Updates

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BG-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: ERFBS

SubSection: 3.11.5 - ERFBS

Compliance Basis:

Fire Compartment BG-01 consists of Rooms 53, 53A, 250, and 251. Room 53, Service Water Valve Room, contains credited ERFBS for several raceways. Each ERFBS has been tested in accordance with, and meets 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 required in BG-01 is inspected periodically per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- C-FP-013.06-106, Rev. 0, "Generic Technical Evaluation for 3M Fire Barrier for Three Hour Designs"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-286AQ-16-2, Sht. 4, Rev. 2, "Conduit Support Detail 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-16-2, Sht. 7, Rev. 2, "Conduit Support Detail 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-16-3, Sht. 2, Rev. 3, "Conduit 1-36058E 3M Interam 3 Hour Fire Wrap"
- E-286AQ-16-3, Sht. 5, Rev. 3, "Conduit Support Detail 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-19-3, Sht. 3, Rev. 3, "Support Detail 3M Interam 3 Hour Fire Rated Wrap"
- E-899A, Sht. 11, Rev. 1, "Equipment/Raceway Fire Protective Coating or Wrapping"
- C-FP-013.06-109, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 53"
- DB-FP-04021, Rev. 7, "Periodic Test Procedure Appendix R Fire Wrap Visual Inspection"
- E-286AQ-16-2, Sht. 6, Rev. 2, "Conduit Support Detail 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-16-3, Sht. 1, Rev. 3, "3M 3 Hour Fire Rated Wrap Conduit 1-36058E"
- E-286AQ-16-3, Sht. 3, Rev. 3, "Conduit Support Detail 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-19-3, Sht. 1, Rev. 3, "3M 3 Hour Fire Rated Wrap Conduits 1-36004E & 1-36005D"
- E-286AQ-19-3, Sht. 4, Rev. 3, "Conduit Support Detail 3M Interam 3 Hour Fire Rated Wrap"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BH-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment BH-01 is the Water Treatment Building and consists of Room 10 (Sample Laboratory), Room 11 (Substation), Room 12 (Chemical Storage Room), Room 12A (Control Room), Room 13 (Chlorination Room), and Room 15 (Filter Room). Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BH-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

EEEEs are used to justify the gap due to a drain located underneath a door and a ventilation duct without a fire damper.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-025
C-FP-013.06-061

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-461, Rev. 13, "Heating Ventilating & Air Conditioning Water Treatment Building Plans and Sections"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BH-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

An EEEE has evaluated the gap below a fire door due to a floor drain and finds the current configuration to provide an acceptable level of protection.

An EEEE has evaluated a penetration seal that is not the minimum tested thickness because the wall thickness is less than the tested seal thickness. This seal has been found to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-025
C-FP-013.06-061

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - BM-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment BM-01 consists of Room A3, Diesel Oil Pump House. Fire barriers are not required because this fire compartment is not adjacent to any structures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BM-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

There are no fire barriers associated with Fire Compartment BM-01; therefore, no fire doors or dampers are required.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- A-88, Rev. 52, "Architectural Door Schedule"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - BM-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment has no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BN-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment BN-01 consists of Room A4, Emergency Diesel Week Tanks. Fire barriers are not required because this fire compartment is not adjacent to any structures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - BN-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

There are no fire barriers associated with Fire Compartment BN-01, and therefore, no fire doors or dampers are required.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - BN-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment has no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - CC-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment CC-01 contains automatic fire detectors credited for Rooms 411, 412, 412A, 413, 414, 415, 417, 417A, 418, 419, 420, 420A, 421, 423, 424, 424A, 424B, 425, and 426. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-007
C-FP-013.06-047
C-FP-013.06-082
C-FP-013.06-084
C-FP-013.06-087
C-FP-013.06-115

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-MI-04817, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 7 C4720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 4, Rev. 11, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 603'"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

References

- Modification 88-0161, "Fire Detection Upgrades"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

Item Number DB-1893 **Item Title:** Relocation of I&C Hot Shop

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - CC-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment CC-01 consists of the following Rooms located on the 603' elevation of the Auxiliary Building: 411 (Corridor), 412 (Corridor), 412A (Corridor), 413 (Trace Analysis Lab), 414 (Health Physics Storage), 415 (Corridor), 417 (Hot Shower Room), 417A (Hot Shower Room), 418 (Decontamination Shower), 419 (Clean Janitor's Closet), 420 (Clean Toilet Room), 420A (Shower Area), 421 (Chemistry Turnover Area), 422 (Vestibule), 422B (Ladder Space), 423 (Chemistry Oil Testing Lab), 424 (Hot Lab), 424A (Chem. Duty Supervisor's Office), 424B (Cold Laboratory), 424C (Counting Room), 425 (Instrumentation Calibration Room), 426 (Personnel Lock Area), 411CC1 (411 Cable Closet 1), 411CC2 (411 Cable Closet 2), and 411CC3 (411 Cable Closet 3). Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An evaluation demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

An evaluation demonstrates a non-rated opening is acceptable.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-115
C-FP-013.06-122
NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

References

- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - CC-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80.

Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A.

Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- IS-DP-04920, Rev. 17, "Nuclear Security Weekly Operability Testing"
- M-452, Rev. 14, "Heating Ventilating & Air Conditioning Access Control Ceiling Space Plan"
- M-455, Rev. 8, "Heating Ventilating& Air Conditioning Access Control Area Plan at El. 603'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - CC-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEE.

Complies with use of EEEE

EEEEs provide justifications for non-rated penetrations.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-007
C-FP-013.06-029
C-FP-013.06-047
C-FP-013.06-082
C-FP-013.06-084
C-FP-013.06-087

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - D-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment D-01 contains credited automatic fire detectors installed per NFPA 72E-1978 for Rooms 216 and 218. The detectors are inaccessible during power operation; therefore, they are inspected, maintained, and tested during refueling outages.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- 12 Reactor Coolant Pumps Oil Collection System

Supporting EEEEs

C-FP-013.06-046

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 15, Rev. 1, "Raceway - Fire Alarm System Containment Plan El 603'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- DB-MI-04827, Rev. 5, "Critical Periodic Test Procedure Functional Test of Inaccessible Detectors for Node 7 C4720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- NPE-98-00088, Rev. 3-20-98, "Davis Besse Nuclear Power Station NFPA Code Review Summary Compliance Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

Fire Compartment - D-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment D-01 consists of Rooms 213 (Reactor Area), 214 (Core Flooding Tank Area), 215 (Let Down Cooler Area), 216 (Steam Generator Area), 217 (Core Flood Tank Area), 218 (Steam Generator Area), 219 (Lower Canal Area), 220 (Incore Instrument Trench Area), 315 (Tank Area), 316 (Flooding Tank Area), 317 (Hatch Area), 317A (Emergency Lock Enclosure), 407 (Hatch Area), 410 (Passage), 580 (Pressurizer Valve Room), 700 (Passage), and 701 (Passage) of the Containment Structure and is located at the 545’-0” through 643’-0” elevations. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An evaluation evaluates the non-fire rated pressure vessel that is the barrier of this fire compartment and concludes the current construction provides an acceptable level of fire protection.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-046

C-FP-013.06-122

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

References

- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-PF-03291, Rev. 10, "Containment Personnel and Emergency Airlocks Seal Leakage Test"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- DB-PF-03009, Rev. 8, "Containment Vessel and Shield Building Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - D-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

There are no fire dampers associated with fire compartment D-01.

Complies

The doors and hatches are part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE evaluates the non-rated pressure vessel that is the barrier of this fire compartment and concludes the current construction provides an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-046

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- DB-PF-03009, Rev. 8, "Containment Vessel and Shield Building Visual Inspection"
- DB-PF-03291, Rev. 10, "Containment Personnel and Emergency Airlocks Seal Leakage Test"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - D-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Penetrations that were not of tested configurations were evaluated in EEEEs and found to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-046

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - DD-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment DD-01 consists of Room 422A, Cable Spreading Room. Room 422A is provided with an automatic wet-pipe sprinkler system.

Complies

This system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989.”

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff

guidance on fire protection, and is acceptable.”

Licensing Actions

- None

Supporting EEEEs

NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-360, Sht. 1, Rev. 1, "Fire Protection Piping, Sprinkler System Rm 422A, Auxiliary Building Elev. 613'6""
- M-360, Sht. 3, Rev. 1, "Fire Protection Piping, Sprinkler System Rm 422A, Auxiliary Building Elev. 613'6""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- M-360, Sht. 2, Rev. 1, "Fire Protection Piping, Sprinkler System Rm 422A, Auxiliary Building Elev. 613'6""
- M-360, Sht. 4, Rev. 1, "Fire Protection Piping, Sprinkler System Rm 422A, Auxiliary Building Elev. 613'6""
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DD-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

The system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DD-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DD-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-360, Sht. 2, Rev. 1, "Fire Protection Piping, Sprinkler System Rm 422A, Auxiliary Building Elev. 613'6""
- M-360, Sht. 4, Rev. 1, "Fire Protection Piping, Sprinkler System Rm 422A, Auxiliary Building Elev. 613'6""
- M-360, Sht. 1, Rev. 1, "Fire Protection Piping, Sprinkler System Rm 422A, Auxiliary Building Elev. 613'6""
- M-360, Sht. 3, Rev. 1, "Fire Protection Piping, Sprinkler System Rm 422A, Auxiliary Building Elev. 613'6""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DD-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for this system meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DD-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment DD-01 consists of Room 422A, Cable Spreading Room, located on the 613’-6” elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An evaluation demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Log No. 409, "Amendment 18 to Facility Operating License"
- Log No. 582, "NRC Letter of July 17, 1980"
- NPE-98-00081, Rev. 4, "Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection"
- PCAQR 89-0334, "Structural Steel Fireproofing Deficiencies"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- Serial No. 617, "May 15, 1979 Tol. Ed. Letter to NRC"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DD-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-0452, Rev. 14, "Heating Ventilation & Air Conditioning Access Control Ceiling Space Plan"
- M-0453, Rev. 16, "Ctrl Rm Sections & Details"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DD-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration Seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DF-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment DF-01 contains automatic fire detectors credited for Room 427, No. 2 Electrical Penetration Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-006
C-FP-013.06-034
C-FP-013.06-037
C-FP-013.06-041
C-FP-013.06-047
C-FP-013.06-082
C-FP-013.06-088

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- E-892, Sht. 4, Rev. 11, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 603'"
- DB-MI-04817, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 7 C4720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DF-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment DF-01 consists of Room 427, No. 2 Electrical Penetration Room. Room 427 is provided with an automatic wet-pipe sprinkler system.

Complies

This system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff

guidance on fire protection, and is acceptable."

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

C-FP-013.06-006
C-FP-013.06-033
C-FP-013.06-034
C-FP-013.06-037
C-FP-013.06-041
C-FP-013.06-082
C-FP-013.06-088
C-FP-013.06-091
C-FP-013.06-092
NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-361, Rev. 1, "Fire Protection Piping, Sprinkler System Room 427, Auxiliary Building Elev. 603'0""
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- None

References

- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-361, Rev. 1, "Fire Protection Piping, Sprinkler System Room 427, Auxiliary Building Elev. 603'0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DF-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment DF-01 consists of Room 427, Number 2 Electrical Penetration Room, on the 603’-6” elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies by Previous NRC Approval

NRC Letter dated July 17, 1980 (Log No. 582) states:

"By letter dated May 15, 1980 [Serial 617], you submitted a revision to the Davis-Besse Unit No. 1 Fire Hazards Report. The revision describes proposed changes to the fire protection methods for several rooms in which the fire-proof coatings to be applied to structural steel, as called for in the original plan, could not be effectively installed. The affected areas are rooms 208, 236, 303, 402, 405, and 427. The alternative you have proposed is to install overhead sprinkler systems in these rooms rather than to apply the fireproof coatings.

We find that the alternative method which you have proposed for the above rooms will provide the protection that we intended in the Davis-Besse Fire Protection Safety Evaluation Report dated July 26, 1979. The changes are therefore acceptable."

Overhead sprinklers have been provided in rooms where structural steel could not be adequately fireproofed. The NRC has reviewed this alternative method and found the changes to be acceptable.

NRC letter dated April 18, 1990 states: “Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage.”

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Log No. 409, "Amendment 18 to Facility Operating License"
- Log No. 582, "NRC Letter of July 17, 1980"
- PCAQR 89-0334, "Structural Steel Fireproofing Deficiencies"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"
- Serial No. 617, "May 15, 1979 Tol. Ed. Letter to NRC"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Where provided, fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

The lack of fire dampers for specific duct penetrations is justified based on EEEEs.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-033
C-FP-013.06-034
C-FP-013.06-037
C-FP-013.06-041

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-2298, Sht. 1, Rev. 02, "BARRIER ID - ROOM 427 "
- A-88A, Rev. 17, "Architectural Door Schedule"
- C-0262, Rev. 10, "Auxiliary Building, Framing Plan El. 623'-0", Structural Steel"
- C-117, Sht. 2, Rev. 09, "CNTMT VESSEL INT & CONCRETE"
- C-1594, Rev. 4, "Barrier Functional List"
- C-219, Sht. 2, Rev. 0054, "AUX BLDG FLOOR PLAN AT EL 603`-0""
- C-222, Sht. 2, Rev. 12, "Sects. & Dets. EL. 603'0" & 623'0""
- C-261, Rev. 18, "Auxiliary Building Framing Plan At El. 603' & 610' Structural Steel"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 582, "NRC Letter of July 17, 1980"
- M-467, Rev. 15, "Fire Damper Schedule"
- M-474, Sht. 50, Rev. 2, "Fire Damper No. FD-1088"
- Serial No. 617, "May 15, 1979 Tol. Ed. Letter to NRC"
- Log No. 409, "Amendment 18 to Facility Operating License"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-474, Sht. 49, Rev. 2, "Fire Damper No. FD-1087 "
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-006
C-FP-013.06-047
C-FP-013.06-082
C-FP-013.06-088
C-FP-013.06-091
C-FP-013.06-092

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DG-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment DG-01 contains automatic fire detectors credited for Room 402, No. 1 Electrical Penetration Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 4, Rev. 11, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 603'"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-MI-04817, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 7 C4720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Modification 88-0161, "Fire Detection Upgrades"

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Open Items and VFDRs

-None

Fire Compartment - DG-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment DG-01 consists of Room 402, No. 1 Electrical Penetration Room. Room 402 is provided with a credited automatic wet-pipe sprinkler system.

Complies

This system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff

guidance on fire protection, and is acceptable.”

Licensing Actions

- None

Supporting EEEEs

NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-358, Rev. 1, "Fire Protection Piping, Sprinkler System Room 402, Auxiliary Building Elev. 603'0""
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - DG-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DG-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DG-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- M-358, Rev. 1, "Fire Protection Piping, Sprinkler System Room 402, Auxiliary Building Elev. 603'0""
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DG-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Fire Compartment - DG-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment DG-01 consists of Room 402, Number 1 Electrical Penetration Room, on the 603’-6” elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies by Previous NRC Approval

Overhead sprinklers have been provided in rooms with structural steel that could not be adequately fireproofed.

NRC Letter dated July 17, 1980 (Log No. 582) states:

"By letter dated May 15, 1980 you submitted a revision to the Davis-Besse Unit No. 1 Fire Hazrds Analysis Report. The revision describes proposed changes to the fire protection methods for several rooms in which the fire-proof coatings to be applied to structural steel, as called for in the original plan, could not be effectively installed. The affected areas are rooms 208, 236, 303, 402, 405, and 427. The alternative you have proposed is to install overhead sprinkler systems in these rooms rather than to apply the fireproof coatings. We find that the alternative method which you have proposed for the above rooms will provide the protection that we intended in the Davis-Besse Fire Protection Safety Evaluation Report dated July 26, 1979. The changes are therefore acceptable."

The structural steel fire protection was accepted in NRC SER dated (LOG 3480) which is complementary to the staff’s Inspection Report No. 50-346/90007 issued on August 22, 1990 (Log No. 1-2345). In Item 15.b (8), which states, “Amendment 18 required the application of a spray-on fire proofing on the supporting structural steel in mechanical and electrical penetration rooms (Rooms 208, 236, 303, 314, 402 and 427). In lieu of using a spray-on fire proofing, sprinklers have been installed in these rooms. Subsequently, the NRC accepted the use of the sprinklers in lieu of a spray-on fire proofing. Although FHAR Revision 6 provides justification for use of suppression systems as the means of protecting against an exposure fire for each of the rooms listed above, the NRC approval did not include Room 314 in the list of those rooms for which structural steel fireproofing was not required. The proposed change reflects the use of sprinklers to protect the supporting structural steel in Rooms 208, 236, 303, 314, 402 and 427. These systems will be upgraded to satisfy NFPA-13 requirements and these upgrades will be completed prior to power ascension from the sixth refueling outage. Thus, the proposed revision provides adequate assurance that the supporting structural steel capabilities will not be compromised.” In addition, the letter states in the “Review of License Amendment Request”, “This issue was identified to the NRC in at least two previous known correspondences and was discussed in NRC Inspection Report No. 346/87027. Based on the inspector's previous review, the documented information and the licensee's justification, it was determined that the existing condition represents an acceptable level of protection.”

Complies with use of EEEE

The structural steel fireproofing that deviates from UL Listed configurations has been evaluated as adequate for the hazard.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 1-2345, "NRC Special Safety Inspection - AUG 22, 1990"
- Log No. 409, "Amendment 18 to Facility Operating License"
- Log No. 582, "NRC Letter of July 17, 1980"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- Serial No. 617, "May 15, 1979 Tol. Ed. Letter to NRC"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DG-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DG-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DH-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment DH-01 consists of the following rooms, located on the 645' and 660' elevations of the Auxiliary Building: Rooms 600, 601, 601A, 602, 705, and 706. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies by Previous Approval

NRC letter dated April 18, 1990 [Log No. 3219] states: "Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage."

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

References

- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - DH-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

Evaluations have been performed for several non-rated fire doors and dampers, as well as penetrations with no fire dampers, and found the current construction adequate for the hazard.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-002
C-FP-013.06-023
C-FP-013.06-049
C-FP-013.06-051

References

- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-88B, Rev. 7, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-417, Rev. 0, "HVAC Auxiliary Building Plan at El. 643'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - DH-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047
C-FP-013.06-054

References

- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - E-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment E-01 contains automatic fire detectors credited for Room 237, Auxiliary Feed Pump Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- 03 Fire Door 215 Equivalent Protection

Supporting EEEEs

C-FP-013.06-028

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 6, Rev. 9, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 565"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - E-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment E-01 consists of Room 237, Aux. Feed Pump 1-1 Room, located on the 565’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An evaluation demonstrates the adequacy of the structural steel fire proofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 03 Fire Door 215 Equivalent Protection

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - E-01

Compliance Statement: Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies by Prior Approval
Prior approval was granted for a non-rated door through a fire barrier.

Complies with use of EEEE
An EEEE provides justification for non-rated ventilation openings.

Licensing Actions

- 03 Fire Door 215 Equivalent Protection

Supporting EEEEs

C-FP-013.06-028

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-413, Rev. 19, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 565'-0""
- M-415, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Sections & Details"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - E-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- 03 Fire Door 215 Equivalent Protection

Supporting EEEEs

C-FP-013.06-024
C-FP-013.06-030

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EE-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment EE-01 contains automatic fire detectors credited for Rooms 500, 501, and 515. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-002
C-FP-013.06-047
C-FP-013.06-049
C-FP-013.06-085

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- E-892, Sht. 2, Rev. 8, "Raceway - Fire Alarm System Auxiliary Building El 623'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04819, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 9 C5796A"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Open Items and VFDRs

-None

Fire Compartment - EE-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment EE-01 consists of Rooms 500, 501, 501DC, and 515. Room 501 is provided with an automatic wet-pipe sprinkler system.

Complies

This system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff

guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-085

NPE-98-00081

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- M-362, Sht. 1, Rev. 0, "Fire Protection Piping, Sprinkler System Room 501, Auxiliary Building Elev 623'0""
- M-362, Sht. 2, Rev. 1, "Fire Protection Piping, Sprinkler System Room 501, Auxiliary Building Elev 623'0""
- M-362, Sht. 3, Rev. 0, "Fire Protection Piping, Sprinkler System Room 501, Auxiliary Building Elev 623'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- Serial No. 1327, "Topic: Appendix R Exemption Requests, January 12, 1987"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EE-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EE-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - EE-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with OS&Y gate valves.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-362, Sht. 2, Rev. 1, "Fire Protection Piping, Sprinkler System Room 501, Auxiliary Building Elev 623'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-362, Sht. 1, Rev. 0, "Fire Protection Piping, Sprinkler System Room 501, Auxiliary Building Elev 623'0""
- M-362, Sht. 3, Rev. 0, "Fire Protection Piping, Sprinkler System Room 501, Auxiliary Building Elev 623'0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EE-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for this system meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EE-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment EE-01 consists of the following rooms, located on the 623' elevation of the Auxiliary Building: Room 500, Radwaste and Fuel Handling Area, Room 501, Radwaste Exhaust Fan Room, Room 501DC, Duct Chase, and Room 515, Purge Inlet Equipment Room. Room 501DC extends up through the 643' elevation. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies by Previous Approval

NRC letter dated April 18, 1990 [Log No. 3219] states: “Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage.”

Complies with use of EEEE

An evaluation demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Will Comply with the Use of Commitment

Update the Control of Combustible procedure to limit transient fire loads within the limits assumed in the structural steel analysis. This activity is being tracked by LAR Attachment S, Open Item DB-1058

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- PCAQR 89-0334, "Structural Steel Fireproofing Deficiencies"
- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- NPE-98-00081, Rev. 4, "Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

Item Number	DB-1058	**Item Title:** Task 1.1; Procedure Revision, DB-FP-0007, Control of Combustibles to Include Duration Limits Based on Fire Modeling

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EE-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

GL 86-10 type evaluations have been performed for several non-rated fire doors and dampers, as well as penetrations with no fire dampers, and found the current construction adequate for the hazard.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-002
C-FP-013.06-037
C-FP-013.06-039
C-FP-013.06-041
C-FP-013.06-049
C-FP-013.06-085

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-88A, Rev. 17, "Architectural Door Schedule"
- A-88B, Rev. 7, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- IS-DP-04920, Rev. 17, "Nuclear Security Weekly Operability Testing"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

References

- M-401, Rev. 10, "Heating Ventilating & Air Conditioning Turbine Building El. 623'-0""
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-416, Rev. 13, "Heating Ventilating & Air Conditioning Auxiliary Building Sections"
- M-453, Rev. 16, "Heating Ventilating & Air Conditioning Control Room Sections and Details"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- M-410, Rev. 26, "HV/AC Aux Bldg Plan at Elev 623'"
- M-415, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Sections & Details"
- M-451, Rev. 24, "Heating Ventilating & Air Conditioning Control Room Plan at El. 623'-0""
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EE-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047
C-FP-013.06-057

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

The Compliance Basis review, Summary and Compliance Statement will follow design, construction, and installation of the Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Analysis, Summary and Compliance Statement will follow design and construction of Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

Analysis, Summary and Compliance Statement will follow design and construction of Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

Analysis, Summary and Compliance Statement will follow design and construction of Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

Analysis, Summary and Compliance Statement will follow design and construction of Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

Analysis, Summary and Compliance Statement will follow design and construction of Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Analysis, Summary and Compliance Statement will follow design and construction of Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Analysis, Summary and Compliance Statement will follow design and construction of Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - EF-01

Compliance Statement: Action Required prior to basis being acceptable for transition

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Analysis, Summary and Compliance Statement will follow design and construction of Emergency Feedwater Facility.

Licensing Actions

- None

Supporting EEEEs

- None

References

- ECP-13-0195-000, Rev. 2, "Engineering Change Package Design Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - F-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment F-01 contains credited automatic fire detection for Room 238, Auxiliary Feed Pump 1-2 Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- 03 Fire Door 215 Equivalent Protection

Supporting EEEEs

C-FP-013.06-028
C-FP-013.06-090

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- E-892, Sht. 6, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 565'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - F-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment F-01 consists of Room 238 (Auxiliary Feed Pump 1-2 Room) located on the 565'-0" elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An evaluation demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 03 Fire Door 215 Equivalent Protection

Supporting EEEEs

C-FP-013.06-122

NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - F-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Door 363 is part of a 3 hour fire barrier indicated on a controlled plant drawing.

Complies by Previous Approval

NRC letter of August 20, 1984 [Log No. 1586] documents an exemption for non-rated Door 215 in the interface between Rooms 237 and 238 and states: "…an engineering evaluation has been performed to determine the fire resistance of Door 215…The licensees conclude that the door, if tested, would have a fire resistance significantly longer than the maximum postulated fire duration. We have reviewed the analysis and agree with the licensees…Based on our evaluation, Fire Door 215 provides a level of safety equivalent to the technical requirements of Section III.G and, therefore, the exemption requested is granted."

Complies with use of EEEE

The lack of rated fire dampers in the interface between Rooms 238 and 326 is considered adequate for the hazard.

Licensing Actions

- 03 Fire Door 215 Equivalent Protection

Supporting EEEEs

C-FP-013.06-028

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-87, Rev. 62, "Architectural Door Schedule"
- A-88, Rev. 52, "Architectural Door Schedule"
- A-89, Rev. 11, "Architectural General Door Details"
- C-1594, Rev. 4, "Barrier Functional List"
- C-258, Rev. 22, "Auxiliary Building Platforms & Details Structural Steel"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- Log No. 1586, "Exemption From Certain Requirements of Appendix R to 1OCFR50"
- M-415, Rev. 23, "Heating Ventilating & Air Conditioning Auxiliary Building Sections & Details"

References

- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - F-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- 03 Fire Door 215 Equivalent Protection

Supporting EEEEs

C-FP-013.06-024
C-FP-013.06-030
C-FP-013.06-090

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill/Cut Out and Barrier Penetration"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - FF-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment FF-01 contains automatic fire detectors credited for Rooms 502, 505, 506, 507, 510, 511, 512, and 513. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-089
C-FP-013.06-112

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- DB-MI-04819, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 9 C5796A"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 2, Rev. 8, "Raceway - Fire Alarm System Auxiliary Building El 623'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Open Items and VFDRs

-None

Fire Compartment - FF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment FF-01 consists of Room 502, Control Cabinet Room; Room 505, Control Room; Room 506, Control Room Toilet; Room 507, Shift Supervisors Office; Room 509, Control Room Passage; Room 510, Computer Room; Room 511, Shift Managers Office; Room 512, SS Admin. Assists Office; and Room 513, Toilet. FF-01 is located on the 623' elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

Evaluations demonstrate the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

Embedded electrical boxes in 1-hour fire barriers in the Control Room Complex, located in Fire Compartment FF-01, have been evaluated and found to be acceptable.

Structural steel fireproofing in FF-01 has been evaluated and concluded to provide adequate protection.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-068 #4
C-FP-013.06-068 #6
C-FP-013.06-089
C-FP-013.06-098
C-FP-013.06-122
NPE-98-00081

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- C-1594, Rev. 4, "Barrier Functional List"

References

- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

-None

Fire Compartment - FF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

EEEE evaluations have been performed for several non-rated fire doors and dampers, as well as penetrations with no fire dampers, and found the current construction adequate for the hazard.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-058
C-FP-013.06-068 #3
C-FP-013.06-112

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"
- M-474, Sht. 27, Rev. 2, "Fire Damper No. FD-1022"
- M-474, Sht. 29, Rev. 2, "Fire Damper No. FD-1024"
- M-474, Sht. 29A, Rev. 1, "Fire Damper No. FD-1024"
- PSI-3000, Rev. 4, "Fire Damper Sleeve FD-1022 3M Interam 3 Hour Fire Wrap"
- PSI-3002, Rev. 3, "Fire Damper Sleeve FD-1024 3M Interam 3 Hour Fire Wrap"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - FF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-010
C-FP-013.06-017
C-FP-013.06-068 #1
C-FP-013.06-068 #2
C-FP-013.06-068 #5
C-FP-013.06-068 #6

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - FF-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment FF-02 contains automatic fire detectors credited for Room 503, Operator Study Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-089

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- E-892, Sht. 2, Rev. 8, "Raceway - Fire Alarm System Auxiliary Building El 623'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- DB-MI-04819, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 9 C5796A"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - FF-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment FF-02 consists of Room 503, Operator Study Room located on the 623’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Evaluations demonstrate the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-068 #6
C-FP-013.06-089
C-FP-013.06-122
NPE-98-00081

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - FF-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- DB-FP-04027, Rev. 6, "Test Fire Door"
- M-451, Rev. 24, "Heating Ventilating & Air Conditioning Control Room Plan at El. 623'-0""
- A-88A, Rev. 17, "Architectural Door Schedule"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - FF-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-068 #1

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - FF-03

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment FF-03 contains automatic fire detectors credited for Room 504, Control Room Kitchen. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-089

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- E-892, Sht. 2, Rev. 8, "Raceway - Fire Alarm System Auxiliary Building El 623'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- DB-MI-04819, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 9 C5796A"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - FF-03

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment FF-03 consists of Room 504, Control Room Kitchen, located on the 623’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

Evaluations demonstrate the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-068 #6
C-FP-013.06-089
C-FP-013.06-122
NPE-98-00081

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - FF-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-0453, Rev. 16, "Ctrl Rm Sections & Details"
- M-451, Rev. 24, "Heating Ventilating & Air Conditioning Control Room Plan at El. 623'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- M-474, Sht. 29, Rev. 2, "Fire Damper No. FD-1024"
- M-474, Sht. 29A, Rev. 1, "Fire Damper No. FD-1024"
- PSI-3002, Rev. 3, "Fire Damper Sleeve FD-1024 3M Interam 3 Hour Fire Wrap"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - FF-03

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-017
C-FP-013.06-068 #1

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - G-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment G-01 consist of the following Rooms: 200 (Clean Liquid Waste Monitoring Tank Room) and 201 (Clean Liquid Waste Monitoring Tank Room) located on the 565’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire-rated barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- M-413, Rev. 19, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 565'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-87, Rev. 62, "Architectural Door Schedule"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - G-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment G-02 contains automatic fire detectors credited for Rooms 206, 209, 221, 227, 230, 231, 232, 234, 235, 240, 241, 242, 243 and 244. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies with Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-003
C-FP-013.06-005
C-FP-013.06-031
C-FP-013.06-055
C-FP-013.06-083
C-FP-013.06-114

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""

- DB-MI-04815, Rev. 7, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 5 C2720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 6, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 565'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - G-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment G-02 consists of Rooms 203, 204, 205, 206, 207, 209, 221, 227, 228, 230, 231, 232, 233, 234, 235, 240, 241, 242, 243, and 244. Room 227, Passageway, is provided with an automatic wet-pipe sprinkler system. Room 235, Boric Acid Evaporator Room 1-1, is provided with a water spray curtain system, actuated by fire detectors, protecting the non-rated wall panels between Room 235 and both Rooms 124 (in Fire Compartment A-05) and 236 (in Fire Compartment A-07).

Complies

The wet-pipe sprinkler system satisfies the NFPA 13 code requirements, and the water spray system satisfies the NFPA 15 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989. The staff also requested that the licensee provide justification that a proposed modification, delineated in the NFPA code comparison, would conform with the criteria in Section 2-1.2 of NFPA Standard No. 15. The licensee stated in

the letter cited above that the modification, which involves adding batteries with a charging system to the fire water spray release control system, will be in accordance with the relevant sections of NFPA 15. The licensee indicated in a telephone conference on February 26, 1991, that this commitment has been implemented."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-005
C-FP-013.06-020
C-FP-013.06-022
C-FP-013.06-031
C-FP-013.06-055
C-FP-013.06-059
C-FP-013.06-114
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04017, Rev. 8, "18 Month RRA Deluge Sprinkler Functional Test"
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- E-988, Sht. 16, Rev. 1, "Fire Protection System, Simplex Custom Control, Logic"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- M-269H, Rev. 0, "Fire Protection System, Sprinkler System - Room 209, Auxiliary Bldg - Elev 565'0""
- M-269M, Rev. 1, "Fire Protection System, Water Curtain-Rm 235, Auxiliary Bldg. - Elev 565'0""
- M-364, Rev. 2, "Fire Protection Piping, Sprinkler System Room 227, Auxiliary Building Elev. 565'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1914, "Fire Protection - Revised National Fire Protection Association Code Compliance for Corridors 209 and 304"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

Each system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements — **Davis-Besse**

Fire Compartment - G-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with these systems annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04017, Rev. 8, "18 Month RRA Deluge Sprinkler Functional Test"
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - G-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

Each system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-269M, Rev. 1, "Fire Protection System, Water Curtain-Rm 235, Auxiliary Bldg. - Elev 565'0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- M-269H, Rev. 0, "Fire Protection System, Sprinkler System - Room 209, Auxiliary Bldg - Elev 565'0""
- M-364, Rev. 2, "Fire Protection Piping, Sprinkler System Room 227, Auxiliary Building Elev. 565'0""
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for these systems meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment G-02 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119, and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An evaluation demonstrated an acceptable level of fire protection was available for a 4’x4’ opening in the fire barrier and a 4’x8’ hatch.

An evaluation demonstrates the adequacy of the structural steel fire proofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-003
C-FP-013.06-019
C-FP-013.06-122
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

EEEEs have determined that the fire barriers' are able to provide an acceptable level of fire protection separation in the fire barriers between Rooms 113A and 227, 228/241 and 312, 227 and 310/313, 205 and 300, and 227 and 110A.

An EEEE has determined that Fire Damper 1101 is acceptable due to low combustible loads and the presence of fire detection and fire suppression.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-018
C-FP-013.06-020
C-FP-013.06-021
C-FP-013.06-022
C-FP-013.06-040
C-FP-013.06-059
C-FP-013.06-119
FCR 86-0220A Attachment

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"

References

- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-005
C-FP-013.06-031
C-FP-013.06-055
C-FP-013.06-083
C-FP-013.06-093
C-FP-013.06-114

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-03

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment G-03 consists of Rooms 210 (SFP Demineralizer Room), 211 (Valve Room), and 212 (Valve Room) located on the 565’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-03

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE has determined that the fire barrier between Rooms 210 and 300 provides an acceptable level of fire protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-040

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - G-03

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Parts of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-036

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - HH-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment HH-01 contains fire detectors credited for Room 603, AC Equipment Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- DB-MI-04818, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test of Detectors for Node 8 C6713"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 1, Rev. 6, "Raceway - Fire Alarm system Auxiliary Building Plan El. 643'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

-None

Fire Compartment - HH-01

Compliance Statement: Complies
Complies with use of EEEE
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment HH-01 consists of the following rooms, located on the 638' and 657'-3" elevations of the Auxiliary Building: Room 603, AC Equipment Room, Room 603A, Records and Storage Area, Room 603B, Vestibule, and Room 703, Passage to Elevator No. 2. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

EEEEs demonstrate the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Will Comply with the Use of Commitment

Update the Control of Combustible procedure to limit transient fire loads within the limits assumed in the structural steel analysis. This activity is being tracked by LAR Attachment S, Open Item DB-1058.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-089
C-FP-013.06-122
NPE-98-00081

References

- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-00007, Rev. 13, "Control of Transient Combustibles"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- NPE-98-00081, Rev. 4, "Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- Modification 89-0082, "Fire Protection for Structural Steel Members in the Auxiliary Building"
- PCAQR 89-0334, "Structural Steel Fireproofing Deficiencies"

Open Items and VFDRs

Item Number	DB-1058	**Item Title:** Task 1.1; Procedure Revision, DB-FP-0007, Control of Combustibles to Include Duration Limits Based on Fire Modeling

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - HH-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

Unrated door openings have been evaluated and are considered adequate for the hazard.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-023

References

- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-88B, Rev. 7, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-401, Rev. 10, "Heating Ventilating & Air Conditioning Turbine Building El. 623'-0""
- M-450, Rev. 26, "Heating Ventilating & Air Conditioning Control Room - Equipment Room Plan at El. 638'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- M-474, Sht. 27, Rev. 2, "Fire Damper No. FD-1022"
- M-474, Sht. 29, Rev. 2, "Fire Damper No. FD-1024"
- M-474, Sht. 29A, Rev. 1, "Fire Damper No. FD-1024"
- PSI-3000, Rev. 4, "Fire Damper Sleeve FD-1022 3M Interam 3 Hour Fire Wrap"
- PSI-3002, Rev. 3, "Fire Damper Sleeve FD-1024 3M Interam 3 Hour Fire Wrap"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

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Fire Compartment - HH-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment II-01 consists of numerous rooms at various elevations in the Turbine Building. The following Rooms contain credited automatic wet pipe sprinklers: 246, 247, 249, 252, 253, 254, 326, 334, 334A, 334B, 430, 431, 431A, 514, 517, 518A, 518B, 604, and 707.

Complies

The systems protecting these rooms satisfy the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection

program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable.”

Licensing Actions	**Supporting EEEEs**
- 11 Embedded Conduits	C-FP-013.06-028 C-FP-013.06-035 C-FP-013.06-044 C-FP-013.06-050 C-FP-013.06-066 C-FP-013.06-071 C-FP-013.06-081 C-FP-013.06-085 C-FP-013.06-090 C-FP-013.06-113

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-058, Rev. 0, "Hot Gas Layer Evaluation of Non-Fire Modeled Compartments in Support of the Multi-Compartment Analysis"
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0365, Rev. 1, "FPP SPRK SYS RM 430"
- M-0366, Rev. 1, "FPP SPRK SYS RM 514"
- M-0367, Rev. 1, "FPP SPRK SYS RM 604"
- M-0368, Rev. 1, "FPP SPRK SYS RM 707"
- M-0369, Sht. 1, Rev. 1, "FPP SPRK SYS TB EL 567"
- M-0369, Sht. 2, Rev. 1, "FPF SPRK SYS TB EL 567"
- M-0369, Sht. 3, Rev. 1, "FPF SPRK SYS TB EL 567"
- M-0369, Sht. 4, Rev. 1, "FPP SPRK SYS TB EL 567"
- M-0370, Sht. 1, Rev. 1, "FPP SPRK SYS TB EL 585"
- M-0370, Sht. 2, Rev. 2, "FPP SPRK SYS TB EL 585"
- M-0370, Sht. 3, Rev. 1, "FPP SPRK SYS TB EL 585"
- M-0370, Sht. 4, Rev. 1, "FPP SPRK SYS TB EL 585"
- M-0370, Sht. 5, Rev. 3, "FPP SPRK SYS TB EL 585"
- M-0371, Sht. 1, Rev. 1, "FPP SPRK SYS TB EL 603"
- M-0371, Sht. 2, Rev. 1, "FPP SPRK SYS TB EL 603"
- M-0371, Sht. 3, Rev. 2, "FPP SPRK SYS TB EL 603"
- M-0371, Sht. 4, Rev. 2, "FPP SPRK SYS TB EL 603"
- M-142F, Sht. 9, Rev. 6, "Railroad Bay Roof Truss"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

References

- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

Each credited water-based automatic suppression system in Fire Compartment II-01 is provided with a water flow alarm.

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

Each credited water-based automatic suppression system in Fire Compartment II-01 is provided with a water flow alarm that annunciates in the Control Room upon actuation.

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

Each credited water-based automatic suppression system in Fire Compartment II-01 is equipped with an OS&Y gate valve.

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for the credited water-based automatic fire suppression systems associated with Fire Compartment II-01 meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-01 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119, and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of Previous Approval

NRC letter dated April 18, 1990 [Log No. 3219] states: "Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage."

Complies with use of EEEE

The lack of a fire damper in the exterior wall, the presence of blow out panels in a fire barrier, and the unrated seal designs in a fire barrier have been evaluated and found to be adequate. The adequacy of the structural steel fire proofing throughout the plant that deviates from UL Listed configurations has been demonstrated as acceptable.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions	**Supporting EEEEs**
- 02 CCW Pump Separation	C-FP-013.06-042
	C-FP-013.06-050
	C-FP-013.06-073
	C-FP-013.06-122

Licensing Actions

Supporting EEEEs

NPE-98-00081

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-01

Compliance Statement: Complies
Complies with use of EEEE
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Many doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Many fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

The EEEEs associated with this compartment evaluate several doors and dampers as adequate for the hazard.

Will Comply with the Use of Commitment

Include the fire dampers installed within a fire-rated door into the inspection procedures per open item DB-1912 in LAR Attachment S.

Licensing Actions	Supporting EEEEs
- 02 CCW Pump Separation	C-FP-013.06-028
	C-FP-013.06-035
	C-FP-013.06-042
	C-FP-013.06-044
	C-FP-013.06-051
	C-FP-013.06-058
	C-FP-013.06-081
	C-FP-013.06-085
	C-FP-013.06-112

References

- A-1507, Rev. 5, "Personnel Shop Facility Door Schedule Details"
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-87, Rev. 62, "Architectural Door Schedule"
- A-88, Rev. 52, "Architectural Door Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- A-88B, Rev. 7, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-401, Rev. 10, "Heating Ventilating & Air Conditioning Turbine Building El. 623'-0""
- M-402, Rev. 16, "Heating Ventilating & Air Conditioning Turbine Building El. 603'-0""
- M-403, Rev. 18, "Heating Ventilating & Air Conditioning Turbine Building El. 585'-0""
- M-404, Rev. 9, "Heating Ventilating & Air Conditioning Turbine Building Part Plans & Sections"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

Item Number DB-1912 **Item Title:** Include inspection of Fire Barriers in Inspection Procedure

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

The penetration seals are considered to be 3-hour rated or equivalent.

In addition, part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

EEEEs have determined that the non-rated openings and penetration seals to be adequate.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-032
C-FP-013.06-035
C-FP-013.06-038
C-FP-013.06-054
C-FP-013.06-066
C-FP-013.06-071
C-FP-013.06-073
C-FP-013.06-075
C-FP-013.06-090
C-FP-013.06-113

References

- 3614-2-E-14Q, Rev. 0, "Nuclear Engineering and Const. Spec."
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

References

- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - II-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment II-02 consists of Room 331, Auxiliary Boiler Room. Room 331 is provided with an automatic wet-pipe sprinkler system.

Complies

This system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff

guidance on fire protection, and is acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-066
C-FP-013.06-071

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0371, Sht. 1, Rev. 1, "FPP SPRK SYS TB EL 603"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-0370, Sht. 6, Rev. 1, "FPP SPRK SYS TB EL 585"
- M-0371, Sht. 3, Rev. 2, "FPP SPRK SYS TB EL 603"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements — **Davis-Besse**

Fire Compartment - II-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-0370, Sht. 6, Rev. 1, "FPP SPRK SYS TB EL 585"
- M-0371, Sht. 3, Rev. 2, "FPP SPRK SYS TB EL 603"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0371, Sht. 1, Rev. 1, "FPP SPRK SYS TB EL 603"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0371, Sht. 3, Rev. 2, "FPP SPRK SYS TB EL 603"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- M-0370, Sht. 6, Rev. 1, "FPP SPRK SYS TB EL 585"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- M-0370, Sht. 6, Rev. 1, "FPP SPRK SYS TB EL 585"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0371, Sht. 3, Rev. 2, "FPP SPRK SYS TB EL 603"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-02 consists of Room 331, Auxiliary Boiler Room, located on the 585' elevation of the Turbine Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

EEEE type evaluations have been performed for a non-rated floor plug and have found the current construction adequate for the hazard.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-88, Rev. 52, "Architectural Door Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-401, Rev. 10, "Heating Ventilating & Air Conditioning Turbine Building El. 623'-0""
- M-402, Rev. 16, "Heating Ventilating & Air Conditioning Turbine Building El. 603'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEE provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-027
C-FP-013.06-066
C-FP-013.06-071
C-FP-013.06-075

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-03

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-03 consists of Room 333, Seal Oil Room, located on the 585' elevation of the Turbine Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-403, Rev. 18, "Heating Ventilating & Air Conditioning Turbine Building El. 585'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-04

Compliance Statement: Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment II-04 consists of the following Rooms located on the 585' elevation of the Turbine Building: 335, 336, 336A, 336B, 336C, 338, 339, 340, 340A, and 341. Rooms 335, 336, 336A, 336B, 340, 340A, and 341 are provided with credited automatic wet pipe sprinklers. Based on inspection, design drawings and periodic testing the wet pipe sprinkler system is considered functional to meet the intended flow densities and coverage as required in the area's performance-based safe shutdown analysis.

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

Log 3480 is NRC Safety Evaluation letter dated May, 30, 1991 (ML033490026) and it states:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

Licensing Actions **Supporting EEEEs**

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-058, Rev. 0, "Hot Gas Layer Evaluation of Non-Fire Modeled Compartments in Support of the Multi-Compartment Analysis"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- M-0371, Sht. 4, Rev. 2, "FPP SPRK SYS TB EL 603"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-0370, Sht. 2, Rev. 2, "FPP SPRK SYS TB EL 585"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-04

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 8, "Non-RRA Wet Pipe Sprinkler System Test"
- M-0370, Sht. 2, Rev. 2, "FPP SPRK SYS TB EL 585"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0371, Sht. 4, Rev. 2, "FPP SPRK SYS TB EL 603"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-04

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarm from the system annunciates in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-0370, Sht. 2, Rev. 2, "FPP SPRK SYS TB EL 585"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0371, Sht. 4, Rev. 2, "FPP SPRK SYS TB EL 603"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-04

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

The system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0371, Sht. 4, Rev. 2, "FPP SPRK SYS TB EL 603"
- M-0370, Sht. 2, Rev. 2, "FPP SPRK SYS TB EL 585"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-04

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for the system associated with these rooms meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- M-0370, Sht. 2, Rev. 2, "FPP SPRK SYS TB EL 585"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-0371, Sht. 4, Rev. 2, "FPP SPRK SYS TB EL 603"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-04

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-04 consists of the following Rooms located on the 585' and 596'-1" elevations of the Turbine Building: 335, 336, 336A, 336B, 336C, 338, 339, 340, 340A, and 341. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with Use of EEEE

An EEEE evaluates a thin barrier due to a heater that is recessed into a CMU wall and determined the current construction provides an acceptable level of protection.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-072
C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-04

Compliance Statement: Complies
Complies with use of EEEE
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE determined that the ventilation ductwork installed in the barrier between Rooms 340A and 439 is adequate for the hazards.

An EEEE determined that the hatch between Rooms 340A and 343 is adequate for the hazards.

Will Comply with the Use of Commitment

Verify the fire-rating of dampers at the perimeter boundaries of this fire compartment. This activity is being tracked by LAR Attachment S, Open Item DB-1878.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-069
C-FP-013.06-074

References

- A-1507, Rev. 5, "Personnel Shop Facility Door Schedule Details"
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-88, Rev. 52, "Architectural Door Schedule"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

References

- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-442, Rev. 5, "Heating Ventilating & Air Conditioning Office Building Plan at El. 585'-0" & 594'-6""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

Item Number DB-1878 **Item Title:** Verification of Fire Damper Rating

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-04

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-069
C-FP-013.06-072
C-FP-013.06-077
C-FP-013.06-086

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-05

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment II-05 consists of Room 337, Oil Drum Storage Room. Room 337 is provided with an automatic wet pipe sprinkler system.

Complies

The wet-pipe sprinkler system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS automatic sprinkler systems and states: "the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-05

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-05 consists of Room 337, Oil Drum Storage Room, located on the 585' elevation of the Turbine Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-87, Rev. 62, "Architectural Door Schedule"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- M-403, Rev. 18, "Heating Ventilating & Air Conditioning Turbine Building El. 585'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-05

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Fire Compartment - II-06

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-06 consists of Room 345, Condensate Storage Tank Room, located on the 585 ft. through the 645 ft. elevations of the Office Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with Use of EEEE

An EEEE provides justification for the barrier separation provided by the ceiling construction.

An EEEE provides justification for floor construction and a penetration.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-076
C-FP-013.06-078
C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-06

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80, and are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101. Fire doors are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

UL 3-hour fire dampers which can not be inspected due to interferences were evaluated in an EEEE. The evaluation concluded that the barrier provides an acceptable level of fire protection by taking credit for the substantial construction of the ductwork and low combustible loading.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-079
C-FP-013.06-081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-88, Rev. 52, "Architectural Door Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-06

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-064
C-FP-013.06-078
C-FP-013.06-094

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-07

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment II-07 consists of Room 347, Lube Oil Filter Room. Room 347 is provided with automatic wet-pipe sprinklers.

Complies

The wet-pipe sprinkler system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

NRC letter of May, 30, 1991 [Log No. 3480] documents the approval of DBNPS automatic sprinkler systems and states: "the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-07

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-07 consists of Room 347, Lube Oil Filter Room, located on the 585' elevation of the Turbine Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- M-403, Rev. 18, "Heating Ventilating & Air Conditioning Turbine Building El. 585'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-07

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration Seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Fire Compartment - II-08

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment II-08 consists of Room 432, Turbine Lube Oil Tank Room. Room 432 is provided with a credited automatic wet-pipe sprinkler system.

Complies

This system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff

guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-073

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-08

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-08 consists of Room 432, Turbine Lube Oil Tank Room, located on the 594'-6" and 603' elevations of the Turbine Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An EEEE concluded a 4" thick reinforced concrete slab barrier is acceptable.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-073
C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - II-08

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-402, Rev. 16, "Heating Ventilating & Air Conditioning Turbine Building El. 603'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-08

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-032
C-FP-013.06-073

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-09

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment II-09 includes fire barriers that are installed in accordance with NFPA 251 or ASTM E119, and are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - II-09

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - II-09

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations using a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- 3614-2-E-14Q, Rev. 0, "Nuclear Engineering and Const. Spec."
- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - J-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment J-01 contains automatic fire detectors credited for Room 319, Diesel Generator 1-2 Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - J-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment J-01 consists of Room 319, Diesel Generator 1-2 Room, and Room 319A, the upper level of the Diesel Generator 1-2 Room. Room 319 is provided with a credited automatic preaction sprinkler system. The fire detectors associated with the preaction sprinkler system are addressed in the 3.8.2 Record.

Complies

This system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May, 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection

program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable.”

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04034, Rev. 6, "18 Month Preaction Functional Test"
- PCAQR 88-1080, "App. A Sprinkler System Deficiencies"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - J-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"

- SD-036B, Rev. 2, "System Description for Fire Detection System"

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - J-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04034, Rev. 6, "18 Month Preaction Functional Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - J-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - J-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - J-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment J-01 consists of Room 319, Diesel Generator 1-2 Room, and Room 319A, Diesel Generator 1-2 Room, located on the 585' elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - J-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - J-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Fire Compartment - J-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment J-02 consists of Room 320A, Day Tank 1-2 Room. Room 320A is provided with a credited automatic wet pipe sprinkler system.

Complies

This system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff

guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - J-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- OS-047B, Sht. 5, Rev. 15, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - J-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- OS-047B, Sht. 5, Rev. 15, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - J-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - J-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for this system meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements — **Davis-Besse**

Fire Compartment - J-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment J-02 consists of Room 320A, Day Tank 1-2 Room, located on the 595' elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - J-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - J-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment K-01 contains automatic fire detectors credited for Rooms 318, Diesel Generator 1-1 Room and 318UL, Diesel Generator 1-1 Room [Upper Level]. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

Fire Compartment - K-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment K-01 consists of Room 318, Diesel Generator 1-1 Room, and Room 318UL, the upper level of the Diesel Generator 1-1 Room. Room 318 is provided with a partial-area credited automatic preaction-type sprinkler system. The fire detectors associated with the preaction sprinkler system are addressed in the 3.8.2 Record.

Complies

This preaction sprinkler system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May 30, 1991 (ML033490026), is as follows:

"In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

"Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04034, Rev. 6, "18 Month Preaction Functional Test"
- M-142-00015, Rev. 6, "Fire Protection For Diesel Gen Rms & Diesel Oil Tk"
- PCAQR 88-1080, "App. A Sprinkler System Deficiencies"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- M-269U, Rev. 0, "Fire Protection System, Emer. Diesel Generator Rooms 318 & 319, Automatic Sprinkler System Conversion"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04034, Rev. 6, "18 Month Preaction Functional Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"

- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

- M-269U, Rev. 0, "Fire Protection System, Emer. Diesel Generator Rooms 318 & 319, Automatic Sprinkler System Conversion"

- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - K-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment K-01 consists of Room 318, Diesel Generator 1-1 Room, and Room 318UL, Diesel Generator 1-1 Room, located on the 585' elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - K-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-047
C-FP-013.06-062

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Fire Compartment - K-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment K-02 consists of Room 321A, Day Tank 1-1 Room. Room 321A is provided with a credited automatic wet pipe sprinkler system.

Complies

This system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989.”

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff

guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-142-00015, Rev. 6, "Fire Protection For Diesel Gen Rms & Diesel Oil Tk"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- OS-047B, Sht. 5, Rev. 15, "Operational Schematic, Fire Suppression System"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements — **Davis-Besse**

Fire Compartment - K-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- OS-047B, Sht. 5, Rev. 15, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- OS-047B, Sht. 5, Rev. 15, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-142-00015, Rev. 6, "Fire Protection For Diesel Gen Rms & Diesel Oil Tk"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for this system meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - K-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment K-02 consists of Room 321A, Day Tank 1-1 Room, located on the 595' elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - K-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-062

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MA-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment MA-01 consists of Room MH3001, Manhole MH3001. Fire barriers are not required because this fire compartment is not adjacent to any structures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MA-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

There are no fire doors or dampers penetrating the barriers surrounding this manhole.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MA-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment is below grade with no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MB-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment MB-01 consists of Room MH3004, Manhole MH3004, located below grade with ceiling level access to the atmosphere above. Fire barriers are not required because this fire compartment is not adjacent to any structures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- E-304, Rev. 43, "Electrical Site Plan"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MB-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

No fire rated doors or dampers penetrate the fire barriers.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MB-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment is below grade with no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MC-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment MC-01 consists of Room MH3005, Manhole MH3005, located below grade with ceiling level access to the atmosphere above. Fire barriers are not required because this fire compartment is not adjacent to any structures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- E-304, Rev. 43, "Electrical Site Plan"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MC-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

A non-rated concrete hatch provides access to this fire compartment from the exterior. No fire rated doors or dampers penetrate the fire barriers. This fire compartment complies with the requirement of NFPA 805 Section 3.11.3.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MC-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment is below grade with no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - ME-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment ME-01 consists of Room MH3041, Manhole MH3041, located below grade with ceiling level access to the atmosphere above. Fire barriers are not required because this fire compartment is not adjacent to any structures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- E-304, Rev. 43, "Electrical Site Plan"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - ME-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

A non-rated concrete hatch provides access to this fire compartment from the exterior. No fire rated doors or dampers penetrate the fire barriers. This fire compartment complies with the requirement of NFPA 805 Section 3.11.3.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - ME-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment is below grade with no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MF-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment MF-01 consists of Room MH3042, Manhole MH3042, located below grade with ceiling level access to the atmosphere above. Fire barriers are not required because this fire compartment is not adjacent to any structures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- E-304, Rev. 43, "Electrical Site Plan"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

No fire doors or dampers penetrate the fire barriers.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MF-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment is below grade with no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MG-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment MG-01 consists of Junction Box JB30D4 located below grade with the ceiling exposed to the atmosphere above. Walls separating MG-01 from adjacent fire compartments provide an acceptable level of protection.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- E-361, Rev. 37, "Raceway Intake Structure"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MG-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

No fire doors or dampers penetrate the fire barriers.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- E-361, Rev. 37, "Raceway Intake Structure"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - MG-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment is below grade with no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MH-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment MH-01 consists of Room MH3009 located below grade with ceiling level access to the atmosphere above. Fire barriers are not required because this fire compartment is not adjacent to any structures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"

- E-304, Rev. 43, "Electrical Site Plan"

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

- E-328, Rev. 14, "Raceway and Grounding Start-Up, Main, & Aux Transformers"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MH-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

A non-rated steel hatch provides access to this fire compartment from the exterior. No fire rated doors or dampers penetrate the fire barriers. This fire compartment complies with the requirement of NFPA 805 Section 3.11.3.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-82, Rev. 3, "Start-Up OI & Bus Transformer O2 Foundation"
- E-328, Rev. 14, "Raceway and Grounding Start-Up, Main, & Aux Transformers"
- C-81, Rev. 4, "Start-Up OI & Bus Transformer Foundations"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - MH-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

This fire compartment is below grade with no adjacent fire compartments. The barriers associated with this fire compartment are not required to meet a fire resistance rating. Penetrations are not required to meet a specific fire rating or configuration to maintain the fire resistance of the fire barrier since no fire resistance rating exists.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- C-1595, Rev. 10, "Penetration Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements — **Davis-Besse**

Fire Compartment - OS

Compliance Statement: Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Fire Compartment OS contains automatic fire detectors credited for Rooms 003 and 004 in Sub-Compartment OS-02, Station Blackout Diesel Generator Building. The detectors are accessible, maintained, and tested in accordance with NFPA 72E. A post-LAR commitment is made to conduct an NFPA 72 code compliance review of the detection in Fire Compartment OS per open item DB-1838 in LAR Attachment S.

Licensing Actions

- None

Supporting EEEEs

- None

References

- C-FP-013.10-039, Rev. 3, "Detailed Fire Modeling OS Fire Compartments (OS-01, OS-02, OS-03, OS-04)"
- E-892, Sht. 21, Rev. 2, "Raceway - Fire Alarm System SBO Diesel"
- DB-MI-04811, Rev. 10, "Supervisory and Functional Test for Node 1 C5401"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

Item Number DB-1838 **Item Title:** Create a NFPA 72 Code Compliance Review for SBO Diesel Generator Building Detection

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - OS

Compliance Statement: Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment OS consists of Sub-Compartments OS-01, OS-02, OS-03, and OS-04. There is no credited automatic fire suppression in OS-01, OS-03, and OS-04.

OS-02, Station Blackout Diesel, contains a credited automatic wet pipe sprinkler system in Rooms 001 and 002.The sprinkler drawings specify the installation is to NFPA 13-1989. There no documented NFPA 13 code compliance review; therefore, a commitment is made per open item DB-2041 in LAR Attachment S to conduct a post-LAR code compliance review.

Licensing Actions

- None

Supporting EEEEs

- None

References

- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-ME-13.04-028, Rev. 2, "Adequacy of Blackout Station Blackout Diesel Sprinkler System"
- M-2501, Rev. 1, "Station Blackout Diesel Sprinkler System"
- C-FP-013.10-039, Rev. 3, "Detailed Fire Modeling OS Fire Compartments (OS-01, OS-02, OS-03, OS-04)"
- M-016A, Rev. 53, "P&ID, Station Fire Protection System"

Open Items and VFDRs

Item Number DB-2041 **Item Title:** Create an NFPA 13 Code Compliance Review for SBO Diesel Generator Building

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements — **Davis-Besse**

Fire Compartment - OS

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- OS-047B, Sht. 6, Rev. 10, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - OS

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- OS-047B, Sht. 6, Rev. 10, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - OS

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- OS-047B, Sht. 6, Rev. 10, "Operational Schematic, Fire Suppression System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - OS

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04031, Rev. 9, "Quarterly Fire Valve Alignment Verification"
- OS-047B, Sht. 6, Rev. 10, "Operational Schematic, Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- M-016A, Rev. 53, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - OS

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment OS includes Sub-Compartments OS-01, OS-02, OS-03, and OS-04. Sub-Compartments were used due to the spatial separation of buildings and specific locations within the yard. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

The non-rated barrier between the Turbine Building and the exterior was evaluated and concluded to provide an acceptable level of protection.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-116
C-FP-013.06-122

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-039, Rev. 3, "Detailed Fire Modeling OS Fire Compartments (OS-01, OS-02, OS-03, OS-04)"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- E-892, Sht. 21, Rev. 2, "Raceway - Fire Alarm System SBO Diesel"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - OS

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

The lack of a fire rated damper in an air intake with the Turbine Building exterior has been evaluated and found to be adequate for the hazard.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-042
C-FP-013.06-120

References

- A-221F, Rev. 9, "Fire Protection General Floor Plan EL. 545'-0" & 555'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-214, Rev. 7, "Auxiliary Building Superstructure Section "B" & Details Sheet 1"
- C-FP-013.10-039, Rev. 3, "Detailed Fire Modeling OS Fire Compartments (OS-01, OS-02, OS-03, OS-04)"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- M-403, Rev. 18, "Heating Ventilating & Air Conditioning Turbine Building El. 585'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- M-402, Rev. 16, "Heating Ventilating & Air Conditioning Turbine Building El. 603'-0""
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - OS

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-016
C-FP-013.06-027
C-FP-013.06-066

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-230F, Rev. 9, "Fire Protection, Intake Structure"
- A-231F, Rev. 3, "Fire Protection Water Treatment Bldg. & Diesel Oil Storage Tank & Pumphouse"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - P-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment P-01 contains automatic fire detectors credited for Room 320, Maintenance. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-009

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - P-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment P-01 consists of Room 320, Maintenance, located on the 585' elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - P-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - P-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Complies with use of EEEE

An EEEE provides justification for the non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-009

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - P-02

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment P-02 contains automatic fire detectors credited for Room 321, Charge Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-009

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 16, Rev. 3, "Raceway Fire Alarm System Auxiliary Building Elev. 585' Partial Plans & Sections"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - P-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment P-02 consists of Room 321, Charge Room, of the Diesel Building at the 585' elevation. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - P-02

Compliance Statement: Complies
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Will Comply with the Use of Commitment

A post-LAR action item DB-0573 included in LAR Attachment S will assess performance-based barriers and their components to verify all perimeter doors and dampers are included in surveillance and maintenance procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number	DB-0726	Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Item Number	DB-0573	**Item Title:** 3.2.3(1) – Review Performance-Based Inspection Requirements to include NFPA 805 credited fire protection equipment

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - P-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE has determined that the non-rated openings and penetration seals to be adequate.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-009

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - P-03

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment P-03 contains automatic fire detectors credited for Room 322, Passage to Diesel Generator Rooms. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May, 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - P-03

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment P-03 consists of Room 322, Passage to Diesel Generator Rooms, of the Auxiliary Building located at the 585' elevation. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - P-03

Compliance Statement: Complies
Complies with use of EEEE
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire-rated barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers in fire-rated barriers are inspected periodically and maintained per procedures.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Complies with use of EEEE

An EEEE evaluated the removable floor hatches and determined that they are adequate for the hazard.

Will Comply with the Use of Commitment

A post-LAR action item DB-0573 included in LAR Attachment S will assess performance-based barriers and their components to verify all perimeter doors and dampers are included in surveillance and maintenance procedures.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-026

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- IS-DP-04920, Rev. 17, "Nuclear Security Weekly Operability Testing"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

References

- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

Item Number	DB-0573	**Item Title:** 3.2.3(1) – Review Performance-Based Inspection Requirements to include NFPA 805 credited fire protection equipment
VFDR Number	DB-0726	Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - P-03

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration Seals were confirmed to be inspected periodically by administrative procedures and maintenance-preventative tasks.

Part of the barrier separation between this and adjacent fire compartments uses a performance-based approach in accordance with NFPA 805 Section 3.11.1.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

Fire Compartment - Q-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment Q-01 contains automatic fire detectors credited for Room 323, High Voltage Switchgear Room B. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Modification 88-0161, "Fire Detection Upgrades"

Open Items and VFDRs

-None

Fire Compartment - Q-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment Q-01 consists of Room 323, High Voltage Switchgear Room B, located on the 585' and 595' elevations of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies by Previous Approval

NRC letter dated April 18, 1990 [Log No. 3219] states: "Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage."

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.06-111, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 323"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

References

- DB-FP-04022, Rev. 3, "18 Month Structural Steel Fireproofing Visual Inspection"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Modification 95-0056, "Resolution to Thermo-Lag Fire Barrier Deficiencies"
- NPE-98-00081, Rev. 4, "Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection"
- PCAQR 89-0334, "Structural Steel Fireproofing Deficiencies"
- RFA 89-1116, "Request for Assistance, Structural Steel Beam F.P."
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"
- Specification A-008F, Rev. 5, "Technical Specification for Operational Phase for Fireproofing on Structural Steel"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - Q-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - Q-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - Q-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: ERFBS

SubSection: 3.11.5 - ERFBS

Compliance Basis:

Fire Compartment Q-01 consists of Room 323, High Voltage Switchgear Room B. Room 323 contains credited ERFBS for several raceways. Each ERFBS has been tested in accordance with, and meets 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 required in Q-01 is inspected periodically per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- C-FP-013.06-106, Rev. 0, "Generic Technical Evaluation for 3M Fire Barrier for Three Hour Designs"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-286AQ-18-3, Rev. 3, "Conduit 1-46008C 4" 3M Interam 3 Hour Fire Wrap"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-FP-013.06-111, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 323"
- DB-FP-04021, Rev. 7, "Periodic Test Procedure Appendix R Fire Wrap Visual Inspection"
- E-899A, SH. 9A, Rev. 1, "Equipment/Raceway Fire Protective Coating or Wrapping"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - R-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment R-01 contains automatic fire detectors credited for Room 324, Auxiliary Shutdown Panel and Transfer Switch Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - R-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment R-01 consists of Room 324, Aux. Shutdown Panel and Transfer Switch Room, located on the 585' elevation of the Auxiliary Building and 324DC, Duct Chase, located on the 603' elevation. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies by Previous Approval

NRC letter dated April 18, 1990 [Log No. 3219] states: "Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage."

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Will Comply with the Use of Commitment

Update the Control of Combustible procedure to limit transient fire loads within the limits assumed in the structural steel analysis. This activity is being tracked by LAR Attachment S, Open Item DB-1058.

Licensing Actions	Supporting EEEEs
- None	C-FP-013.06-122
	NPE-98-00081

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.06-104, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 324"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-00007, Rev. 13, "Control of Transient Combustibles"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Modification 89-0082, "Fire Protection for Structural Steel Members in the Auxiliary Building"
- NPE-98-00081, Rev. 4, "Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection"
- PCAQR 89-0334, "Structural Steel Fireproofing Deficiencies"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"
- Specification A-008F, Rev. 5, "Technical Specification for Operational Phase for Fireproofing on Structural Steel"

Open Items and VFDRs

Item Number	DB-1058	**Item Title:** Task 1.1; Procedure Revision, DB-FP-0007, Control of Combustibles to Include Duration Limits Based on Fire Modeling

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - R-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-403, Rev. 18, "Heating Ventilating & Air Conditioning Turbine Building El. 585'-0""
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-416, Rev. 13, "Heating Ventilating & Air Conditioning Auxiliary Building Sections"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - R-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - R-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: ERFBS

SubSection: 3.11.5 - ERFBS

Compliance Basis:

Fire Compartment R-01 consists of Rooms 324 and 324DC. Room 324, Aux. Shutdown Panel and Transfer Switch Room, contains credited ERFBS for several raceways. Each ERFBS has been tested in accordance with, and meets 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 required in R-01 is inspected periodically per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- C-FP-013.06-104, Rev. 0, "Technical Evaluation for 3M Fire Barrier for Room 324"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-286AQ-10-3, Sht. 1, Rev. 3, "Conduit 36204A Detail 3M Interam 3 Hour Fire Rated Wrap"
- E-286AQ-10-3, Sht. 3, Rev. 3, "Conduit 36204A Detail 3M Interam 3 Hour Fire Rated Wrap"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-FP-013.06-106, Rev. 0, "Generic Technical Evaluation for 3M Fire Barrier for Three Hour Designs"
- DB-FP-04021, Rev. 7, "Periodic Test Procedure Appendix R Fire Wrap Visual Inspection"
- E-286AQ-10-3, Sht. 2, Rev. 3, "Conduit 36204A Detail 3M Interam 3 Hour Fire Rated Wrap"
- E-899A, SH. 9A, Rev. 1, "Equipment/Raceway Fire Protective Coating or Wrapping"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - S-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment S-01 contains automatic fire detectors credited for Room 325, High Voltage Switchgear Room A. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - S-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment S-01 consists of Room 325, High Voltage Switchgear Room A, located on the 585’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies by use of EEEE

Fireproofing of steel decks in Fire Compartment S-01 was evaluated by EEEE to be no longer needed and was abandoned in place.

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-97-00218 in Modification 95-0056
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Modification 95-0056, "Resolution to Thermo-Lag Fire Barrier Deficiencies"
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-CSS-013.15-011, Rev. 0, "Structural Steel Fireproofing in Room 325"
- DB-FP-04022, Rev. 3, "18 Month Structural Steel Fireproofing Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Modification 89-0082, "Fire Protection for Structural Steel Members in the Auxiliary Building"
- NPE-97-00218, "Thermo-Lag at Structural Steel Beam Interface"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

References

- NPE-98-00081, Rev. 4, "Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- PCAQR 89-0334, "Structural Steel Fireproofing Deficiencies"
- Specification A-008F, Rev. 5, "Technical Specification for Operational Phase for Fireproofing on Structural Steel"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - S-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

-None

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - S-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - T-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment T-01 contains automatic fire detectors credited for Room 328, CCW Heat Exchanger and Pump Room. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-014

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04813, Rev. 5, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 3 C3520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - T-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment T-01 consists of Room 328, Component Cooling Water Heat Exchanger and Pump Room. Room 328 is provided with an automatic wet-pipe sprinkler system.

Complies

This system satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection

program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable.”

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-014
C-FP-013.06-044
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- M-357, Rev. 1, "Fire Protection Piping, Sprinkler System Room 328, Auxiliary Building Elev 585'0""
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - T-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - T-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

- None

References

- DB-FP-04019, Rev. 11, "Non-RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - T-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-357, Rev. 1, "Fire Protection Piping, Sprinkler System Room 328, Auxiliary Building Elev 585'0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - T-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - T-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment T-01 consists of Room 328, CCW Heat Exchanger and Pump Room, located on the 585’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An engineering evaluation demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

An engineering evaluation concludes that the barrier between Rooms 328 and 326 provides an acceptable level of fire protection and is not degraded to an unacceptable level by considering the steel plates as part of the fire barrier instead of the doors.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-044
C-FP-013.06-122
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - T-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An EEEE evaluation has been performed for non-rated fire doors and has found the current construction adequate for the hazard.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-044

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-403, Rev. 18, "Heating Ventilating & Air Conditioning Turbine Building El. 585'-0""
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-455, Rev. 8, "Heating Ventilating& Air Conditioning Access Control Area Plan at El. 603'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - T-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-014
C-FP-013.06-029

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - U-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment U-01 contains automatic fire detectors credited for Room 310, Passage, Room 312, Spent Fuel Pump Room, and Room 313, Hatch Area. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-012
C-FP-013.06-013
C-FP-013.06-084
C-FP-013.06-120

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""

- DB-MI-04816, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 6 C3720"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Open Items and VFDRs

-None

Fire Compartment - U-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment U-01 consists of Room 310, Passage, Room 312, Spent Fuel Pump Room, and Room 313, Hatch Area. Rooms 310 and 313 are provided with an automatic wet-pipe sprinkler system.

Complies

This system satisfies the majority of the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection

program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-012
C-FP-013.06-013
C-FP-013.06-022
C-FP-013.06-084
C-FP-013.06-120
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- M-355, Rev. 1, "Fire Protection Piping, Sprinkler System Room 310/313, Auxiliary Building Elev. 585'0""
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - U-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

This system is provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - U-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with this system annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - U-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

This system is equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-355, Rev. 1, "Fire Protection Piping, Sprinkler System Room 310/313, Auxiliary Building Elev. 585'0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - U-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valve for this system meets the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - U-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment U-01 consists of Rooms 310 (Passage), 312 (Spent Fuel Pump Room), and 313 (Hatch Area) of the Auxiliary Building located at the 585' elevation. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - U-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

The use of removable floor hatches has been evaluated and is considered adequate for the hazard.

A fire barrier penetrated by a duct that has no fire damper to an enclosed outside vestibule was evaluated and concluded to be adequate for the hazard.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-018
C-FP-013.06-021
C-FP-013.06-022
C-FP-013.06-120

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-455, Rev. 8, "Heating Ventilating& Air Conditioning Access Control Area Plan at El. 603'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - U-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-012
C-FP-013.06-013
C-FP-013.06-084
C-FP-013.06-095

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - UU-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment UU-01 consists of the following four Rooms: 327 (Turbine Building Elevator Machine Room), 329 (Vestibule), AB-1 (Auxiliary Building Stairwell), and EL-2 (Auxiliary Building Elevator), located on the 585’, 603’, 623’, 643’, and 657’-3” elevations of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - UU-01

Compliance Statement: Complies
Will Comply with the Use of Commitment

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Will Comply with the Use of Commitment

Fire rated elevator doors will be included on a fire door schedule per open item DB-0846 included in LAR Attachment S.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

- None

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- A-88, Rev. 52, "Architectural Door Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- A-88B, Rev. 7, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- IS-DP-04920, Rev. 17, "Nuclear Security Weekly Operability Testing"
- M-403, Rev. 18, "Heating Ventilating & Air Conditioning Turbine Building El. 585'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

Item Number	DB-0846	**Item Title:** Task 1.2; Modify Door Schedule Drawing to Include Stationary Elevator Doors

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - UU-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- 02 CCW Pump Separation

Supporting EEEEs

C-FP-013.06-010
C-FP-013.06-014
C-FP-013.06-038
C-FP-013.06-087

References

- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-227F, Rev. 4, "Fire Protection General Roof Plan"
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - V-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment V-01 contains automatic fire detectors credited for Rooms 300, 301, 302, 304, 400, 405, and 406 . The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-007
C-FP-013.06-012
C-FP-013.06-013
C-FP-013.06-019
C-FP-013.06-047
C-FP-013.06-057

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-MI-04816, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 6 C3720"
- DB-MI-04817, Rev. 6, "Critical Periodic Test Procedure Supervisory and Functional Test of Accessible Detectors for Node 7 C4720"

References

- E-892, Sht. 4, Rev. 11, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 603'"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Modification 88-0161, "Fire Detection Upgrades"
- E-892, Sht. 5, Rev. 9, "Raceway - Fire Alarm System Auxiliary Building Plan El 585'-0""
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

Fire Compartment - V-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.1 - NFPA Standards

Compliance Basis:

Fire Compartment V-01 consists of several rooms at various elevations in the Auxiliary Building, consisting primarily of the Fuel Handling Area, Fuel Storage Area and several Passages. Room 304 “Corridor” and Room 405 “Storage” are each provided with a credited NFPA 13 automatic wet-pipe sprinkler system.

Complies

The systems for Room 304 and Room 405 and Room 304 satisfies the NFPA 13 code requirements.

Complies by Previous Approval

The NFPA 13 code review for the wet-pipe sprinkler system includes minor non-compliances that have been resolved by justification or modification. A deviation was submitted to account for these non-compliances and was accepted by NRC staff in Log 3480.

The supporting excerpt from Log 3480 NRC Safety Evaluation dated May 30, 1991 (ML033490026), is as follows:

“In its comparison of the Davis-Besse fire protection program with Appendix A to the BTP, the licensee identified deviations related to sprinkler and water spray system conformance with the criteria contained in NFPA Standard Nos. 13 and 15. Deviations were identified which were associated with Design and acceptance test criteria and other guidance for certain system components. An example is the lack of identification signs on valves not directly related to system performance. The staff reviewed the licensee's justification for these deviations and agrees with the licensee that they lack significance in that the plant personnel are trained to recognize the valve number identification. The licensee also identified a number of deviations pertaining to the positioning of sprinkler heads and water spray nozzles in relation to structural elements and other plant features which could represent obstructions to the discharge of water from the sprinkler systems. Other deviations were noted such as improper sprinkler type, temperature rating, and inadvertently painted sprinkler heads. As delineated in its letters dated May 23, 1988 and July 31, 1989, the licensee has committed to correct most of these conditions so that the final configuration will be in conformance with the subject NFPA Standards. The staff has reviewed the deviations which will not be corrected, along with the licensee's justification for not doing so, and agrees that the subject deviation represents an acceptable level of protection based on such factors as the limited combustible loading in the affected areas. The licensee indicated in a telephone conference on February 26, 1991, that it will make those corrections required to be in compliance with Appendix A to the BTP during the eighth refueling outage in the spring of 1993. Those changes required to be in compliance with Appendix R to 10 CFR Part 50 have been completed. During its review of the licensee's NFPA Code conformance comparison, the staff requested justification as to why several criteria were judged by the licensee to be not applicable to Davis-Besse. The licensee provided a satisfactory response to these questions in its letter dated October 11, 1989."

“Based on the above review and evaluation of the licensee's fire protection program, and subject to the approved deviations and exemptions and the licensee's commitments to implement various additional fire protection measures during the seventh and eighth refueling outages, the staff concludes that the fire protection

program at Davis-Besse conforms with the guidelines in Appendix A to the BTP, the requirements of Appendix R to 10 CFR Part 50 and the supplemental staff guidance on fire protection, and is acceptable."

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-012
C-FP-013.06-013
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-226F, Rev. 13, "Fire Protection General Floor Plan EL. 643'-0""
- A-228F, Rev. 2, "Fire Protection Sections A-A & B-B"
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- M-269E, Rev. 0, "Fire Protection Piping, Sprinkler System - Corridor 304, Auxiliary Building Elev. 585'-0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SE89-0171, Rev. 1, "Safety Evaluation for MOD 89-0079"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- Serial No. 1914, "Fire Protection - Revised National Fire Protection Association Code Compliance for Corridors 209 and 304"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - V-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.2 - Water Flow Alarm

Compliance Basis:

These systems are each provided with a water flow alarm.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - V-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.3 - Suppression system annunciation

Compliance Basis:

The alarms associated with these systems annunciate in the Control Room upon actuation.

Licensing Actions

- None

Supporting EEEEs

- None

References

- DB-FP-04018, Rev. 10, "RRA Wet Pipe Sprinkler System Test"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"
- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - V-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.5 - OS&Y gate valve

Compliance Basis:

These systems are each equipped with an OS&Y gate valve.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- M-359, Rev. 1, "Fire Protection Piping, Sprinkler System Room 405, Auxiliary Building Elev. 603'-0""
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- M-269E, Rev. 0, "Fire Protection Piping, Sprinkler System - Corridor 304, Auxiliary Building Elev. 585'-0""
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - V-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Water-Based Suppression

SubSection: 3.9.6 - Valve Performance

Compliance Basis:

The controlling gate valves for these systems meet the supervision criteria of NFPA 805 Section 3.5.14.

Licensing Actions

- None

Supporting EEEEs

- None

References

- M-016B, Rev. 52, "P&ID, Station Fire Protection System"
- SD-036B, Rev. 2, "System Description for Fire Detection System"
- SD-036A, Rev. 4, "System Description for Automatic and Manual Fire Suppression System"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - V-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment V-01 consists of Rooms 222 (Fuel Transfer Tube Room), 223 (Cask Pit), 224 (Spent Fuel Storage Pool), 300 (Fuel Handling Area), 300A (Cask Wash Area), 300B (Drum Storage), 301 (Solid Waste Baler Area), 302 (Drumming Station), 304 (Corridor), 305 (Decontamination Area), 306 (New Fuel Storage), 400 (Passage), 401 (Fuel Handling Exhaust Unit Room), 404 (Corridor), 405 (Storage), 406 (Hot Instrument Shop), and TT (Transfer Tubes) on the 565', 585', 603', and 623' elevations of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119.

Fire barriers are inspected periodically and maintained per procedures.

Complies by Previous NRC Approval

Overhead sprinklers have been provided in rooms where structural steel could not be adequately fireproofed.

NRC Letter dated July 17, 1980 (Log No. 582) states: "By letter dated May 15, 1980 you submitted a revision to the Davis-Besse Unit No. 1 Fire Hazrds Analysis Report. The revision describes proposed changes to the fire protection methods for several rooms in which the fire-proof coatings to be applied to structural steel, as called for in the original plan, could not be effectively installed. The affected areas are rooms 208, 236, 303, 402, 405, and 427. The alternative you have proposed is to install overhead sprinkler systems in these rooms rather than to apply the fireproof coatings. We find that the alternative method which you have proposed for the above rooms will provide the protection that we intended in the Davis-Besse Fire Protection Safety Evaluation Report dated July 26, 1979. The changes are therefore acceptable."

Complies with use of EEEE

The structural steel fireproofing that deviates from UL Listed configurations has been evaluated as adequate for the hazard in an EEEE.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions	Supporting EEEEs
- None	C-FP-013.06-122
	NPE-97-00218 in Modification 95-0056

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Licensing Actions

Supporting EEEEs

NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 409, "Amendment 18 to Facility Operating License"
- Log No. 582, "NRC Letter of July 17, 1980"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- Serial No. 617, "May 15, 1979 Tol. Ed. Letter to NRC"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - V-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

GL 86-10 type evaluations have been performed for several non-rated floor hatches and found the current construction to provide an acceptable level of protection.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-019
C-FP-013.06-040

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- A-88, Rev. 52, "Architectural Door Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- DB-PF-03009, Rev. 8, "Containment Vessel and Shield Building Visual Inspection"
- DB-PF-03291, Rev. 10, "Containment Personnel and Emergency Airlocks Seal Leakage Test"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- M-410, Rev. 26, "HV/AC Aux Bldg Plan at Elev 623'"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- M-416, Rev. 13, "Heating Ventilating & Air Conditioning Auxiliary Building Sections"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

References

- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Fire Compartment - V-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Complies with use of EEEE

EEEEs provide justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-007
C-FP-013.06-012
C-FP-013.06-013
C-FP-013.06-016
C-FP-013.06-047
C-FP-013.06-057
C-FP-013.06-067
C-FP-013.06-095

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL. 623'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

References

- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - VA-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment VA-01 consists of Room AB-3A, Aux. Building Stairwell, which traverses the 565', 585', 603' and 623' elevations of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan El. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan El. 623'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- C-1594, Rev. 4, "Barrier Functional List"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - VA-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- A-229F, Rev. 5, "Fire Protection Sections C-C & D-D"
- A-88, Rev. 52, "Architectural Door Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-410, Rev. 26, "HV/AC Aux Bldg Plan at Elev 623'"
- M-413, Rev. 19, "Heating Ventilating & Air Conditioning Auxiliary Building Plan at El. 565'-0""
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - VA-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-222F, Rev. 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-223F, Rev. 22, "Fire Protection, General Floor Plan EL. 585'-0""
- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Rev. 19, "Fire Protection General Floor Plan EL 623'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - X-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment X-01 contains credited automatic fire detectors for Room 428, Low Voltage Switchgear Room F Bus. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: "The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable."

Licensing Actions

- 11 Embedded Conduits

Supporting EEEEs

C-FP-013.06-088

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- E-892, Sht. 4, Rev. 11, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 603'"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"
- DB-MI-04814, Rev. 8, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 4 C4520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Modification 88-0161, "Fire Detection Upgrades"

Open Items and VFDRs

-None

Fire Compartment - X-01

Compliance Statement: Complies
Complies by Previous Approval
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment X-01 consists of Room 428, Low Voltage Switchgear Room F Bus, and Room 428B, Number 1 Electrical Isolation Room, located on the 603' elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies by Previous Approval

NRC letter dated April 18, 1990 [Log No. 3219] states: "Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage."

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1594, Rev. 4, "Barrier Functional List"
- A-88A, Rev. 17, "Architectural Door Schedule"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

References

- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"

Open Items and VFDRs

VFDR Number DB-2010 Oil containment systems for Unit Sub Transformers

Install oil containment systems for the Unit Sub transformers located in compartments X-01 and Y-01. These containments to be designed to contain a minimum 10% (23 gal) oil spill.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR.

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - X-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Complies

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Complies with use of EEEE

The use of removable floor hatches has been evaluated and is considered adequate for the hazard.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-026

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-467, Rev. 15, "Fire Damper Schedule"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - X-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier, with the exception of penetrations justified by EEEEs. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Complies with use of EEEE

An EEEE provides justification for non-rated penetrations.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-006
C-FP-013.06-088

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - X-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment X-02 consists of Room 428A located on the 603’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - X-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - X-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - Y-01

Compliance Statement: Complies
Complies by Previous Approval

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Detection

SubSection: 3.8.2 - Detection

Compliance Basis:

Complies

Fire Compartment Y-01 contains automatic fire detectors credited for Room 429, Low Voltage Switchgear Room E Bus. The detectors are accessible and are located, maintained, and tested in accordance with NFPA 72E.

Complies by Previous Approval

NRC letter of May, 30, 1991 [Log No. 3480] documents the approval of DBNPS fire protection measures and states: “The staff requested information from the licensee regarding the design of the fire detection…with respect to the criteria contained in NFPA Standard No…72E. This information was provided by the licensee in its letters dated May 27, 1987; May 23, 1988; July 31 and October 11, 1989. The licensee identified a number of deviations from these standards and committed to correct a number of them. The remainder represent conditions which the licensee has determined are not safety significant…The staff has evaluated these deviations and the licensee's justification and concludes that the Davis-Besse fire protection measures assures a level of protection equivalent to that achieved by strict conformance with the NFPA Codes. On this basis, we find these subject deviations acceptable.”

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- E-892, Sht. 4, Rev. 11, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 603'"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- DB-MI-04814, Rev. 8, "Critical Periodic Test Procedure Supervisory and Functional Test for Node 4 C4520"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1497, "Response to Questions 19, 20, and 29 from RAI and Code Compliance Review NFPA 72E and 13"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Davis-Besse

Fire Compartment - Y-01

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment Y-01 consists of Room 429, Low Voltage Switchgear Room E Bus, and Room 429A, Number 2 Electrical Isolation Room, located on the 603' elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with use of EEEE

An EEEE demonstrates the adequacy of structural steel fireproofing throughout the plant that deviates from UL Listed configurations.

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122
NPE-98-00081

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

VFDR Number	DB-2010	Oil containment systems for Unit Sub Transformers

Install oil containment systems for the Unit Sub transformers located in compartments X-01 and Y-01. These containments to be designed to contain a minimum 10% (23 gal) oil spill.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR.

Table B-1 Transition of Fundamental Fire Protection Program and Design Elements Worksheet
Fire Protection Features
Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - Y-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- DB-FP-04036, Rev. 8, "Appendix R Fire Door 18 Month Inspection"
- M-412, Rev. 29, "Heating- Ventilating & Air Conditioning Auxiliary Building Plan at El. 585'-0""
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04026, Rev. 9, "24-Hours Fire Door Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- M-467, Rev. 15, "Fire Damper Schedule"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements

Fire Compartment - Y-01

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Penetrations are sealed to the fire resistance rating of the associated barrier. Penetration seals were confirmed to be inspected periodically by administrative procedures and maintenance preventative tasks.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-1595, Rev. 10, "Penetration Schedule"
- DB-FP-04038, Rev. 6, "TEN PERCENT (10%) PENETRATION SEAL VISUAL INSPECTION"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- EN-DP-01142, Rev. 2, "Core Drill / Cut Out and Barrier Penetrationsd"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - Y-02

Compliance Statement: Complies
Complies with use of EEEE

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.2 - Fire barriers

Compliance Basis:

Complies

Fire Compartment Y-02 consists of Room 429B, Battery Room A, located on the 603’ elevation of the Auxiliary Building. Fire barriers are designed and installed in accordance with NFPA 251 or ASTM E119. Fire barriers are inspected periodically and maintained per procedures.

Complies with the use of EEEE

The depth of the masonry layer protecting embedded conduits was evaluated and concluded to be equivalent to a 1-hour fire resistance.

Licensing Actions

- None

Supporting EEEEs

C-FP-013.06-122

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- C-1594, Rev. 4, "Barrier Functional List"
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

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

Fire Protection Features

Transition Report

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - Y-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.3 - Fire barrier penetrations

Compliance Basis:

Doors penetrating fire barriers are designed and installed in accordance with NFPA 252 and NFPA 80. Fire dampers are designed and installed in accordance with UL 555 and NFPA 90A. Fire doors and fire dampers are listed fire-rated assemblies consistent with the fire resistance rating of the corresponding fire barrier as required per NFPA 101 and NFPA 90A. Fire doors and fire dampers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04024, Rev. 8, "18 Month Fire Damper Visual Inspection"
- DB-FP-04028, Rev. 05, "APPENDIX A FIRE DOOR 18 MONTH INSPECTION"
- M-467, Rev. 15, "Fire Damper Schedule"
- A-88A, Rev. 17, "Architectural Door Schedule"
- DB-FP-04027, Rev. 6, "Test Fire Door"
- M-411, Rev. 25, "HV/AC Aux Bldg Plan at Elev 603'"
- SD-036C, Rev. 02, "SYSTEM DESCRIPTION FOR FIRE BARRIERS"

Open Items and VFDRs

-None

NFPA 805 Chapter 3 Fundamental Fire Protection Program and Design Elements **Davis-Besse**

Fire Compartment - Y-02

Compliance Statement: Complies

Post-Transition Methods:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Fire Protection Features Form: Passive Protection

SubSection: 3.11.4 - Through Penetration Fire Stops

Compliance Basis:

Complies

Penetrations are sealed to the fire resistance rating of the associated barrier and fire barriers are inspected periodically and maintained per procedures.

Licensing Actions

- None

Supporting EEEEs

- None

References

- A-224F, Rev. 24, "Fire Protection General Floor Plan EL. 603'-0""
- DB-FP-04023, Rev. 19, "Fire Rated Barrier Visual Inspection"
- C-1594, Rev. 4, "Barrier Functional List"

Open Items and VFDRs

-None

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

136 Pages Attached

Transition Report Attachment

Davis-Besse

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

Transition Report Section: **- Attachments**

Transition Report Subsection: **B - NEI 04-02 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 Section:

3.0 - Deterministic Methodology

Alignment Statement: Aligns

[Reference: NEI 00-01, Rev. 2, "Guidance for Post-Fire Safe Shutdown Circuit Analysis"]

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. For a complete understanding of the deterministic requirements, work this section in combination with the information in Appendix C, High/Low Pressure Interfaces, Appendix D, Alternative and Dedicated Shutdown Requirements, Appendix E, Acceptance Criteria for Operator Manual Actions and repairs, and Appendix H, Hot Shutdown versus Important to Safe Shutdown Components. To resolve the industry issue related to MSOs, refer to Section 4, Appendix B, Appendix F and Appendix G. The plant specific analysis approved by NRC is reflected in the plant’s licensing basis. The methodology described in this section is an acceptable method of performing a post-fire safe shutdown analysis. This methodology is depicted 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. The requirements of Appendix R Section III.G.2 do not apply to the circuits for fire detection and suppression systems, communications systems and 8-hour emergency lighting systems.

Additional information is provided in Appendix B to this document related to the circuit failure criteria to be applied in assessing impacts to post-fire safe shutdown, including MSOs. The criteria in Appendix B developed for MSOs has also been included in Section 3.5.1.1 for assessing the potential affects of fire-induced impacts to individual components on the required safe shutdown path for a particular III.G.1 and 2 fire area. Section 4 provides the Resolution Methodology for determining the Plant Specific List of MSOs to be evaluated. Section 5 provides a focused-scope Fire PRA risk methodology for assessing, on an individual basis, the risk significance of any MSOs determined to be impacted within a common plant fire area. The appropriate use of these tools for mitigating the effects of fire-induced circuit failures for this section and for the MSOs addressed in Section 4 and Appendix G are discussed in Appendix H.

Alignment Basis:

The Davis-Besse specific analysis approved by the NRC is contained in the Fire Hazard Analysis Report (FHAR). The FHAR methodology in general is consistent with the guidance provided in NEI 00-01 with some exceptions:

Emergent industry issues related to operator manual actions (OMAs) and multiple spurious operations (MSOs) are being addressed during the transition to NFPA 805. The issues were reviewed and analyzed per the guidance provided in NEI 00-01 and NEI 04-02. This does not impact the FHAR selection of systems, equipment, cables and the identification of their location for use in the transitioning nuclear safety analysis.

Using the criteria from Appendix H of NEI 00-01, Rev 2 to classify each impacted cable/component as either a required or important to SSD cable/component is part of the methodology used to determine if an OMA is permitted or another resolution is required to resolve MSOs and comply with the requirement of Appendix R 10CFR50. The classifications were not industry standards or regulatory requirements at the time component identification and cable selection was performed for the Davis-Besse fire area evaluations. Therefore, cables and components were not classified as "required for safe shutdown" or "important for safe shutdown". This does not impact the FHAR selection of systems, equipment, cables, and the identification of their location for use in the transitioning nuclear safety analysis. The FHAR identifies a "justification" when the protection of cables and/or components in a fire area of systems whose function is required for Hot Shutdown does not meet Appendix R requirements.

For NEI 00-01, Rev. 2, Section 3.2.2.3 and 3.4.1.9, the FHAR has no information related to the identification and evaluation of instrument tubing that may cause subsequent effects on instrument readings or signals for the purpose of safe shutdown equipment identification and analysis. Instrument routing in fire areas was addressed during the transition to NFPA 805.

This particular record provides an overview of the methodology and contains no specific guidance. Site documentation is reviewed for alignment with specific guidance and is presented by subsection in subsequent records.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1 - Safe Shutdown Systems and Path Development

Alignment Statement: Aligns

This section discusses the identification of systems 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. 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. This section provides some guidance on classifying components as either required or important to SSD circuit components. It also provides some guidance on the tools available for mitigating the effects of fire-induced circuit failures to each of these classes of equipment. For a more detailed discussion of the topic of required and important to SSD components refer to Appendix H.

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 required 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 required for 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 (as defined in NRC Information Notice 84-09)
- Support systems
    - Electrical power and control systems
    - Component Cooling systems
    - Component Lubrication 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.

The components required to perform these functions are classified as required for hot shutdown components. These components are necessary and sufficient to perform the required safe shutdown functions assuming that fire-induced impacts to other plant equipment/cables do not occur. Since fire-induced impacts to other plant equipment/cables can occur in the fire condition, these impacts must also be addressed. The components not necessary to complete the required safe shutdown functions, but which could be impacted by the fire and cause a subsequent impact to the required safe shutdown components are classified as either required for hot shutdown or important to SSD components. Depending on the classification of the components, the tools available for mitigating the affects of fire-induced damage vary. The available tools are generally discussed in this section and in detail in Appendix H. The classification of a component or its power or control circuits may vary from fire area to fire area. Therefore, the required safe shutdown path for any given fire area is comprised of required for hot shutdown components and important to SSD components. The distinction and classification for each required safe shutdown path for each fire area should be discernible in the post-fire safe shutdown analysis.

Generic Letter 81-12 specifies consideration of associated circuits of concern with the potential for spurious equipment operation and/or loss of power source, and the common enclosure failures. As described above, spurious operations/actuations can affect the accomplishment of the required safe shutdown functions listed above. Typical examples of the effects of the spurious operations of concern are the following:

• A loss of reactor pressure vessel/reactor coolant inventory in excess of the safe shutdown makeup capability
• 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. To address the issue of multiple spurious operations, Section 4 provides a Resolution Methodology for developing a Plant Specific List of MSOs for evaluation. Appendix B provides the circuit failure criteria applicable to the evaluation of the Plant Specific list of MSOs.

Common power source and common enclosure concerns could also affect the safe shutdown path and must be addressed.

In addition to the tools described for components classified as required for hot shutdown, fire-induced impacts to cables and components classified as important to SSD may be mitigated using some additional tools. For important to SSD component failures, operator manual actions, fire modeling and/or a focused-scope fire PRA may be used to mitigate the impact. (If the use of a Focused-Scope Fire PRAs is not permitted in the Plants Current License Basis, then, a License Amendment Request (LAR) will be necessary to use the Focused-Scope Fire PRA).

Alignment Basis:

From FHAR Section 1.0, The Davis-Besse Unit 1 Fire Hazard Analysis Report documents the analysis performed for Davis-Besse to ensure compliance with the requirements of 10 CFR 50, Appendix R, Sections III.G, III.J, III.L and III.O. An analysis was performed to identify the safe shutdown systems necessary to achieve and maintain Hot Standby and subsequent Cold Shutdown in the event of a postulated fire. After the requisite systems were identified, the related components and circuits were identified and located in the individual fire areas. At this time, the Associated Circuits review was also conducted. The fire area determinations were performed concurrent to this effort by evaluating the adequacy of the fire area boundaries and review of fire hazards. The Safe Shutdown components and circuits were then reviewed for compliance with the specific separation criteria of 10CFR50, Appendix R, Section III.G.2. The methodologies for these reviews are described in their respective sections of the FHAR.

Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1 - Criteria/Assumptions

Alignment Statement: Aligns

The following criteria and assumptions should be considered, as applicable, when identifying systems available and necessary to perform the required safe shutdown functions and combining these systems into safe shutdown paths. This list provides recognized examples of criteria/assumptions but should not be considered an all-inclusive list. The final set of criteria/assumptions should be based on regulatory requirements and the performance criteria for post-fire safe shutdown for each plant.

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.1 - Safe Shutdown Paths for BWRs

Alignment Statement: Not Applicable

[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 10 CFR 50, Appendix R. Any of the shutdown paths (methods) described in this report are considered to be acceptable methods for achieving redundant safe shutdown.

Alignment Basis:

Davis-Besse is a Pressurized Water Reactor (PWR) design.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.2 - SRVs and LPCI/CS for BWRs

Alignment Statement: Not Applicable

[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 10 CFR 50 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.

Alignment Basis:

Davis-Besse is a Pressurized Water Reactor (PWR) design.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.3 - Pressurizer Heaters

Alignment Statement: Aligns

[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.

Alignment Basis:

FHAR Section 3.3 describes how the shutdown functions will accomplished and contains the following criteria related to RCS pressure control and the need for pressurizer heaters.

Section 3.3.2 Reactor Coolant Pressure and Level Control

During and following a postulated fire concurrent with a loss of offsite Power (LOOP), the RCS will be cooled down by natural circulation. Cooldown will be controlled so as to ensure that subcooling within the RCS is maintained.

Section 3.3.3 Reactor Heat Removal

Decay Heat removal in Hot Standby is accomplished by natural circulation through the use of the Auxiliary Feedwater pumps supplying water to the steam generators from the condensate storage tanks and rejecting heat from the steam generators to the atmosphere through the Atmospheric Vent Valves (or the Main Steam Safety Valves as a backup).

FHAR Section 3.6 describes the functions of the safe shutdown system, which contains the following assumption related to the need for pressurizer heater for RCS pressure control:

Sections 3.6.3 Reactor Coolant System (RCS)

For alternate shutdown fire areas, the essential pressurizer heaters are not required to be assured to maintain hot standby.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.4 - Alternative Shutdown Classification

Alignment Statement: Aligns

The classification of shutdown capability as alternative/dedicated shutdown is made independent of the selection of systems used for shutdown. Alternative/dedicated 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 operator manual actions to the extent allowed by the regulations and the licensing basis of the plant (see Appendix E), repairs (cold shutdown only), exemptions, deviations, GL 86-10 fire hazards analyses or fire protection design change evaluations permitted by GL 86-10, as appropriate. These may also be used in conjunction with alternative/dedicated shutdown capability. A discussion of time zero for the fire condition, as it relates to operator manual actions and repairs, is contained in Appendix E.

Alignment Basis:

Introduction Section 1.4 of the FHAR discusses the criteria for using alternate shutdown capability and where it is implemented at Davis-Besse.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

The classifications "alternative shutdown" and "cold shutdown" are not applicable to NFPA 805. The requirement under NFPA 805 is for the plant to achieve a "safe and stable state". Alternative shutdown areas are transitioned using the performance-based approach under NFPA 805.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.5 - Operable and Available

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 3.4 identifies the requirements and assumptions that must be met to demonstrate safe shutdown capability.

Section 3.4.2 Assumptions

1. At the onset of a fire, both trains of systems required to be operable for safe shutdown are functional (i.e., none of the safe shutdown system components, except spare standby components, are assumed to be under maintenance or test.)

2. The plant is operating at 100 percent power.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.6 - No Concurrent DBAs

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 3.4 identifies the requirements and assumptions that must be met to demonstrate safe shutdown capability.

Section 3.4.1 Requirements

8. No concurrent or sequential design basis accidents or transients which would not occur as a direct result of these assumptions are assumed.

9. No random single failures other than those which occur as a direct result of the postulated fire are assumed.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.7 - Offsite Power Availability

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 3.4 identifies the requirements and assumptions that must be met to demonstrate safe shutdown capability.

Section 3.4.1 Requirements

2. Loss of offsite AC power

    a. For alternative shutdown for areas (BF, DD, FF, EE, HH, or Q), the alternative shutdown capability shall accommodate post-fire conditions where offsite power is available and where offsite power is not available for 72 hours.

    b. For "normal shutdown" fire areas, a loss of offsite power is only required to be considered if the fire can cause the loss of offsite power.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.8 - Safety-related Classification

Alignment Statement: Aligns

Post-fire safe shutdown systems and components are not required to be safety-related.

Alignment Basis:

FHAR Section 3.4 identifies the requirements and assumptions that must be met to demonstrate safe shutdown capability.

Section 3.4.1 Requirements

6. Unless they are an integral part of, or interface with other existing safety systems, systems installed to provide post-fire shutdown capability are not designed to meet the Seismic Category I criteria, single failure criterion, or other design basis event criteria.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.9 - 72-hour Coping Period

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 3.4 identifies the requirements and assumptions that must be met to demonstrate safe shutdown capability.

Section 3.4.1 Requirements

2. Loss of offsite AC power

   a. For alternative shutdown for areas (BF, DD, FF, EE, HH, or Q), the alternative shutdown capability shall accommodate post-fire conditions where offsite power is available and where offsite power is not available for 72 hours.

   b. For "normal shutdown" fire areas, a loss of offsite power is only required to be considered if the fire can cause the loss of offsite power.

3. The capability to achieve and maintain hot standby is ensured.

4. For alternative shutdown fire areas (BF, DD, FF, EE, HH, or Q), the plant will be able to achieve cold shutdown within 72 hours and will be able to maintain cold shutdown conditions thereafter.

FHAR Section 4.0 contains the results of the fire area evaluations and describes the assumptions, requirements, and methodology used to demonstrate compliance with Appendix R, Section III.G.

4.2 Requirements

The requirements for fire protection of safe shutdown capability are defined in Appendix R, Section III.G. This regulation requires that fire protection be provided to ensure that one train of equipment necessary to achieve and maintain safe shutdown remains available in the event of a fire at any location within the plant. For hot standby conditions, one train of the necessary systems must be free of fire damage (III.G.1.a). For cold shutdown conditions, both trains of equipment necessary to achieve and maintain cold shutdown condition may be damaged by a single fire, including an exposure fire, but damage must be limited so that at least one train can be repaired within 72 hours using in-place procedures and materials available on site (III.G.1.b).

While the FHAR methodology is consistent with the guidance provided in NEI 00-01, in light of the NFPA 805 requirement to achieve "safe and stable state" versus the ability "to achieve and maintain cold shutdown within 72 hours" in Appendix R, Davis-Besse aligns with the intent of the guidance.

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.1.1.10 - Manual Initiation of Systems

Alignment Statement: Aligns

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 (See Appendix E); automatic initiation of systems selected for safe shutdown is not required but may be included as an option, if the additional cables and equipment are also included in the analysis. Spurious actuation of automatic systems (Safety Injection, Auxiliary Feedwater, High Pressure Coolant Injection, Reactor Core Isolation Cooling, etc.) due to fire damage, however, should be evaluated.

Alignment Basis:

For the FHAR, only manual initiation of systems required to achieve and maintain safe shutdown is credited. Automatic initiation of systems required to achieve and maintain safe shutdown (i.e., SFRCS, SFAS actuation signal initiation) is not credited. However, fire-induced automatic initiation signals are evaluated for the possibility of spurious component operation and their subsequent adverse impact on safe shutdown.

The Davis-Besse safe shutdown analysis was performed based on the assumption that manual initiation from the main control room or emergency control stations of systems required to achieve and maintain safe shutdown is acceptable. This assumption was not based on the current guidance in Appendix E of NEI 00-01, Rev. 2, since it did not exist at that time. Operator manual actions (OMAs) were evaluated during the transition to NFPA 805 per the guidance provided in NEI 00-01 and NEI 04-02.

This FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.1.11 - Multi-unit Plant

Alignment Statement: Not Applicable

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.

Alignment Basis:

Davis-Besse is a single unit facility.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.2 - Shutdown Functions

Alignment Statement: Aligns

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."

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.2.1 - Reactivity Control

Alignment Statement: Aligns

[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. Each licensee should have an operator manual action to either vent the instrument air header or remove RPS power in their post-fire safe shutdown procedures. The presence of this action precludes the need to perform circuit analysis for the reactivity control function and is an acceptable way to accomplish this function. If this action is a "time critical" action, the timing must be justified.

[PWR] Makeup/Charging

There must be a method for ensuring that adequate shutdown margin is maintained from initial reactor SCRAM to cold shutdown conditions, by controlling Reactor Coolant System temperature and ensuring borated water is utilized for RCS makeup/charging.

Alignment Basis:

FHAR Section 3.3 describes how safe shutdown functions will be accomplished.

Section 3.3.1 Reactor Reactivity Control

Safe shutdown of the reactor is performed by a manual trip from the Control Room. An automatic trip will occur in the event of loss of offsite power (LOOP). After a reactor trip, the reactivity control function must be capable of achieving and maintaining at least a 1 percent reactivity shutdown margin (D k/k) from zero power hot standby to cold shutdown. The function must be capable of compensating for any reactivity changes associated with xenon decay and the reactor coolant temperature decrease that occurs during cooldown to cold shutdown conditions.

The Makeup and Purification System (MUPS), High Pressure Injection System (HPIS), and Decay Heat Removal System (DHRS) provide boron injection for subsequent reactivity control during cooldown. The Makeup Pumps take suction from the Makeup Tank or Borated Water Storage Tank (BWST). The HPIS and DHRS take suction from the BWST. The BWST contains borated water at a concentration controlled by the technical specifications.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

<u>Open Items and VFDRs</u>

-None

NEI 00-01 Section:

3.1.2.2 - Pressure Control Systems

Alignment Statement: Aligns

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)

Initial pressure control may be provided by the SRVs mechanically cycling at their setpoints (electrically cycling for EMRVs). Mechanically-actuated SRVs require no electrical analysis to perform their overpressure protection function.The SRVs may also be 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 (ADS) is not a required function. Automatic initiation of the ADS may be credited, if available. If automatic ADS is not available and use of ADS is desired, an alternative means of initiation of ADS separate from the automatic initiation logic for accomplishing the pressure control function should be provided.

[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.

Alignment Basis:

FHAR Section 3.3 describes how safe shutdown functions will be accomplished.

Section 3.1.2 Reactor Coolant Pressure and Level Control

Reactor coolant pressure control is required to assure that the Reactor Coolant System is operated:

a. Within the technical specifications for Reactor Coolant System pressure requirements;

b. To prevent peak Reactor Coolant System pressure from exceeding 110 percent of system design pressure;

The reactor coolant makeup control function shall be capable of ensuring that sufficient makeup inventory is provided to compensate for Reactor Coolant System (RCS) fluid losses due to identified leakage from the Reactor Coolant System water volume during cooldown from hot standby to cold shutdown conditions, and to compensate for contraction volume of the RCS such that the reactor coolant level can be maintained within the level indication in the pressurizer. The systems used for the makeup function are those previously mentioned for the Reactor reactivity control function (Section 3.3.1). Letdown is not required since the inventory added through making up the contraction volume is adequate for reactivity control if letdown cannot be re-established. RCS inventory will be managed by cooling down the RCS.

During and following a postulated fire concurrent with a loss of offsite Power (LOOP), the RCS will be cooled down by natural circulation. Cooldown will be controlled so as to ensure that subcooling within the RCS is maintained.

The RCS Code Safety Valves, RC13A and RC13B, prevent peak RCS pressure from exceeding 110 percent of system design pressure.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.2.3 - Inventory Control

Alignment Statement: Aligns

[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. Spurious actuation of automatic systems, however, should be evaluated (High Pressure Coolant Injection, High Pressure Core Spray, Reactor Core Isolation Cooling, etc.).

[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. Spurious actuation of automatic systems, however, should be evaluated (Safety Injection, High Pressure Injection, Auxiliary Feedwater, Emergency Feedwater, etc.).

Alignment Basis:

FHAR Section 3.3 describes how safe shutdown functions will be accomplished.

Section 3.1.2 Reactor Coolant Pressure and Level Control

Reactor coolant pressure control is required to ensure that the reactor coolant system is operated:

a. Within the technical specifications for reactor coolant system pressure requirements;

b. To prevent peak reactor coolant system pressure from exceeding 110 percent of system design pressure.

The reactor coolant makeup control function shall be capable of assuring that sufficient makeup inventory is provided to compensate for reactor coolant system (RCS) fluid losses due to identified leakage from the Reactor Coolant System water volume during cooldown from hot standby to cold shutdown conditions, and to compensate for contraction volume of the RCS such that the reactor coolant level can be maintained within the level indication in the pressurizer. The systems used for the makeup function are those previously mentioned for the reactor reactivity control function (Section 3.3.1). Letdown is not required since the inventory added through making up the contraction volume is adequate for reactivity control if letdown cannot be re-established. RCS inventory will be managed by cooling down the RCS.

During and following a postulated fire concurrent with a loss of offsite power (LOOP), the RCS will be cooled down by natural circulation. Cooldown will be controlled so as to ensure that subcooling within the RCS is maintained.

The RCS Code Safety Valves, RC13A and RC13B, prevent peak RCS pressure from exceeding 110 percent of system design pressure.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

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Davis-Besse

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.2.4 - Decay Heat Removal **Alignment Statement:** Aligns

[BWR] Systems selected for the decay heat removal function(s) should be capable of:
• Removing sufficient decay heat from primary containment, to prevent containment over-pressurization and failure.
• Satisfying the net positive suction head requirements of any safe shutdown systems taking suction from the containment (suppression pool).
• Removing sufficient decay heat from the reactor to achieve cold shutdown. (This is not a hot shutdown requirement.)

[PWR] Systems selected for the decay heat removal function(s) should be capable of:
• 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.
• Removing sufficient decay heat from the reactor to reach cold shutdown conditions. (This is not a hot shutdown requirement.)

This does not restrict the use of other systems.

Alignment Basis:

FHAR Section 3.3 describes how safe shutdown functions will be accomplished.

3.3.3 Reactor Heat Removal

The reactor (decay) heat removal function shall be capable of transferring fission product decay heat from the reactor core at a rate such that specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded. The function shall be capable of achieving cold shutdown.

Decay heat removal in hot standby is accomplished by natural circulation through the use of the Auxiliary Feedwater Pumps supplying water to the steam generators from the condensate storage tanks and rejecting heat from the steam generators to the atmosphere through the Atmospheric Vent Valves (or the Main Steam Safety Valves as a backup). In the event of a long-term plant cooldown, a backup supply of water to the Auxiliary Feedwater System is provided from the service water system or by manual alignment from the fire water system.

The secondary system pressure in the steam generators is maintained within allowable limits during cooldown by operation of the Atmospheric Vent Valves. The steam generator water level is maintained by the Auxiliary Feedwater System or the Motor-Driven Feedwater Pump (as an alternate). Decay heat removal in cold shutdown is provided by the decay heat removal system (DHRS) through the Decay Heat Coolers. The component cooling water system (CCWS) provides cooling to the Decay Heat Coolers, and is in turn cooled by the service water system (SWS).

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

The NFPA 805 requirement is to achieve a "safe and stable state" versus the ability "to reach cold shutdown conditions".

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.1.2.5 - Process Monitoring

Alignment Statement: Aligns

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 (10 CFR 50 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/dedicated shutdown (III.G.3). The use of this same list for III.G.2 redundant Post-Fire Safe Shutdown is acceptable, but the analyst needs to review the specific license basis for the plant under evaluation. In general, process monitoring instruments similar to those listed below are needed to successfully use existing operating procedures (including Abnormal Operating Procedures).

BWR
- Reactor coolant level and pressure
- Suppression pool level and temperature
- Emergency or isolation condenser level
- Diagnostic instrumentation for safe shutdown systems
- Level indication for tanks needed for safe shutdown

PWR
- Reactor coolant temperature (hot leg / cold leg)
- Pressurizer pressure and level
- Neutron flux monitoring (source range)
- Level indication for tanks needed for safe shutdown
- Steam generator level and pressure
- 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.

Alignment Basis:

FHAR Section 3.3 describes how safe shutdown functions will be accomplished.

Section 3.3.4 Process Monitoring

When information on process variables is required by operators to modify safe shutdown system alignments or to control safe shutdown equipment, such monitoring information must be available from the Control Room or local control stations. The process monitoring function shall be capable of providing direct readings of those plant process variables necessary for plant operators to perform and/or control the identified safe shutdown functions. The functions monitored are source range flux, RCS temperature and pressure, pressurizer level, and steam generator level and pressure.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.2.6.1 - Electrical Systems

Alignment Statement: Aligns

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 any beneficial effects of 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 may 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 125VDC distribution system can be powered from source feed 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).

Alignment Basis:

FHAR Section 3.3 describes how safe shutdown functions will be accomplished.

Section 3.3.5 Supporting Systems

The systems and equipment used to perform the previous functions require miscellaneous supporting functions. The supporting functions required are process cooling (CCWS and SWS), area cooling for certain rooms (HVAC) and Essential AC/DC power. Lubrication is covered as part of the safe shutdown system components. The supporting functions listed below (as discussed later in this section) shall be available and capable of providing the support necessary to ensure acceptable performance of the previously identified safe shutdown functions:

a. Component Cooling Water System
b. Service Water System
c. Essential Power
d. HVAC
e. Containment Air Cooling System
f. Control Room Emergency Ventilation System
g. Emergency Diesel Generators

FHAR Section 3.6 provides a brief overview of the individual safe shutdown systems used and the functions they provide.

Section 3.6.13 Essential Electrical Distribution System (ESSPWR)

The Essential Electrical Distribution System consists of essential 4160V, 480V, 240V, and 120V AC power, as well as 125V DC power.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.2.6.2 - Cooling Systems

Alignment Statement: Aligns

Various cooling water systems are required to support safe shutdown system operation, based on plant specific considerations. Typical uses include:
- RHR/SDC/DH Heat Exchanger cooling water
- Safe shutdown pump cooling (seal coolers, oil coolers)
- Diesel generator cooling

Alignment Basis:

FHAR Section 3.3 describes how safe shutdown functions will be accomplished.

Section 3.3.5, Supporting Systems- The systems and equipment used to perform the previous functions require miscellaneous supporting functions. The supporting functions required are process cooling (CCWS and SWS), area cooling for certain rooms (HVAC), and Essential AC/DC power. Lubrication is covered as part of the safe shutdown system components. The supporting functions listed below (as discussed later in this section) shall be available and capable of providing the support necessary to assure acceptable performance of the previously identified safe shutdown functions:

a. Component Cooling Water System
b. Service Water System
c. Essential Power
d. HVAC
e. Containment Air Cooling System
f. Control Room Emergency Ventilation System
g. Emergency Diesel Generators

FHAR Section 3.6 provides a brief overview of the individual safe shutdown systems used and the functions they provide.

Section 3.3.6.9 Component Cooling Water System (CCWS)

The Component Cooling Water System is a closed-loop supporting system to other safe shutdown systems. Two redundant trains are available, each consisting of one pump and heat exchanger and associated valves, piping and local instrumentation. The CCW System is provided with three centrifugal pumps which are normally lined up such that one is operating, one is in standby, and one is an installed spare which can be utilized in place of either of the other two CCW pumps.

The CCWS serves as an intermediate heat transfer loop between the various safe shutdown components and the Service Water System (ultimate heat sink).

Section 3.3.6.10 Service Water System (SWS)

The Service Water System provides cooling for the following safe shutdown heat transfer equipment:

1. Component Cooling Water Heat Exchangers

2. Control Room Emergency Ventilation System (CREVS) Condenser Units.

3. Decay Heat Removal Pumps Bearing Housing Coolers

4. Emergency Diesel Generator Jacket Cooling Water Heat Exchangers

5. Makeup Pump Bearing and Gear Lube Oil Coolers

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.2.6.3 - HVAC Systems **Alignment Statement:** Aligns

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, however, are not required to support post-fire safe shutdown in all cases. The need for HVAC system operation is based on plant specific configurations and plant specific heat loads. Typical potential uses include:
• Main control room, cable spreading room, relay room
• ECCS pump compartments
• Diesel generator rooms
• Switchgear rooms

Plant specific evaluations are necessary to determine which HVAC systems could be required or useful in supporting post-fire safe shutdown. Transient temperature response analyses are often utilized to demonstrate that specific HVAC systems would or would not be required. If HVAC systems are credited, the p otential for adverse fire effects to the HVAC system must also be considered, including:
• Dampers closing due to direct fire exposure or due to hot gases flowing through ventilation ducts from the fire area to an area not directly affected by the fire. Where provided, smoke dampers should consider similar effects from smoke.
• Recirculation or migration of toxic conditions (e.g., smoke from the fire, suppressants such as Carbon Dioxide).

In certain situations, adequate time exists to open doors to provide adequate cooling to allow continued equipment operation. Therefore, the list of required safe shutdown components as it relates to HVAC Systems may be determined based on transient temperature analysis. Should this analysis demonstrate that adequate time exists to open doors to provide the necessary cooling, this is an acceptable approach to achieving HVAC Cooling. The temperature analysis must demonstrate the adequacy of the cooling effect from opening the door within the specified time. Only those components whose operation is required to provide HVAC Cooling for required safe shutdown components in a time frame that cannot be justified for operator manual actions are considered themselves to be required safe shutdown components. This latter set of HVAC Cooling Components are required to meet the criteria for required safe shutdown components with regard to the available mitigating tools.

Alignment Basis:

FHAR Section 3.3 describes how safe shutdown functions will be accomplished.

Section 3.3.5 Supporting Systems

The systems and equipment used to perform the previous functions require miscellaneous supporting functions. The supporting functions required are process cooling (CCWS and SWS), area cooling for certain rooms (HVAC) and essential AC/DC power. Lubrication is covered as part of the safe shutdown system components. The supporting functions listed below (as discussed later in this section) shall be available and capable of providing the support necessary to assure acceptable performance of the previously identified safe shutdown functions:

a. Component Cooling Water System
b. Service Water System
c. Essential Power
d. HVAC
e. Containment Air Cooling System
f. Control Room Emergency Ventilation System
g. Emergency Diesel Generators

FHAR Section 3.6 provides a brief overview of the individual safe shutdown systems used and the functions they provide.

Section 3.6.4 Containment Air Cooling System (CACS)

The Containment Air Cooling System consists of three air cooling units and fans. In order to achieve Cold Shutdown with the RCPs tripped, only one containment air cooling (CAC) unit is required to operate. For the Appendix R analysis, only one CAC unit is required to be assured CAC #1 and CAC #2 are the accredited components for shutdown.

Section 3.6.5 Control Room Emergency Ventilation System (CREVS)

The Control Room Emergency Ventilation System consists of two recirculation centrifugal fans (3300 cfm), two dual condenser air cooling units (water cooled and air cooled), two motor-operated fresh air intake dampers, two sets of filter banks (prefilter, high efficiency absolute filter, and charcoal absorber) and the associated dampers and ductwork.

Section 3.6.11 Heating Ventilation and Air Conditioning (HVAC)

Essential HVAC is provided for area cooling for safe shutdown systems/components that generate a large heat load to assure a suitable environment for equipment and personnel. The systems are safety grade and seismic Class I (except Backup SW Pump Room). The availability of room cooling for the following rooms is assured to support safe shutdown:

1. Low Voltage Switchgear Rooms
2. Battery Rooms
3. Emergency Diesel Generator Rooms
4. AFW Pump Rooms
5. SW Pump Rooms
6. Backup SW Pump Room

The FHAR methodology is consistent with the guidance provided in NEI 00-01. This review acknowledges that the NFPA 805 requirement to achieve a "safe and stable state" is not the same as the ability "to achieve cold shutdown" in Appendix R.

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Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.1.3 - Methodology for Shutdown System Selection

Alignment Statement: Aligns

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:

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.1.3.1 - Identify Safe Shutdown Functions

Alignment Statement: Aligns

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:

- Operating Procedures (Normal, Emergency, Abnormal)
- System descriptions
- Fire Hazard Analysis
- Single-line electrical diagrams
- Piping and Instrumentation Diagrams (P&IDs)
- [BWR] GE Report GE-NE-T43-00002-00-01-R02 entitled “Original Shutdown Paths for the BWR”

Alignment Basis:

FHAR Section 3.3 identifies the systems needed to accomplish the safe shutdown functions specified in Appendix R.

Section 3.3.1 Reactor Reactivity Control

Section 3.3.2 Reactor Coolant Pressure and Level Control

Section 3.3.3 Reactor Heat Removal

Section 3.3.4 Process Monitoring

Section 3.3.5 Supporting Systems

Section 3.3.6 Cold Shutdown within 72 Hours

Section 3.3.7 High/Low Pressure Interface Valves

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

NFPA 805 requirement is to achieve a "safe and stable state" versus the ability "to reach cold shutdown conditions."

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.1.3.2 - Identify Combinations of Systems That Satisfy Each Safe Shutdown Function

Alignment Statement: Aligns

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 other equipment whose mal-operation or spurious operation could impact the required safe shutdown function. The components in this latter set are classified as either required for hot shutdown or as important to SSD as explained in Appendix H.

Alignment Basis:

FHAR Section 3.5 identifies the criteria and methodology for Safe Shutdown Systems Determination.

3.5.1 Introduction

The shutdown analysis utilized herein identifies a minimum set of plant systems (safe shutdown systems) and components necessary to achieve the functional goals and ensure compliance to the requirements of Appendix 1 of the FHAR. An assessment has been made to demonstrate that there is adequate protection of this minimum set of systems from the effects of postulated fires concurrent with the loss of offsite power (LOOP). This approach yields an adequate and conservative demonstration of the ability to achieve and maintain safe shutdown in the event of a fire.

3.5.2 Methodology

A review of plant shutdown requirements was performed to identify those systems needed to provide reactivity control, reactor coolant makeup, and reactor heat removal when achieving Hot Shutdown and when subsequently achieving Cold Shutdown. Those systems needed to monitor process variables (level, flow, etc.), those systems needed to provide support functions (cooling, lubrication, etc.) and those systems which could cause automatic actuation (i.e., SFRCS, SFAS) of these systems were also identified. All such systems were included as safe shutdown systems.

A review of the plant piping and instrument diagrams (P&IDs) was then performed to identify the components within these systems that are required to achieve each safe shutdown function.

Appendix A provides a detailed list of these safe shutdown components.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-2 Nuclear Safety Capability Assessment
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NEI 00-01 Section:

3.1.3.3 - Define Combination of Systems for Each Safe Shutdown Path

Alignment Statement: Aligns

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, paths may be defined on a divisional basis since the availability of electrical power and other support systems must be demonstrated for each path. During the equipment selection phase, identify any additional support systems and list them for the appropriate path.

Alignment Basis:

FHAR Section 3.6, Safe Shutdown Systems, describes the systems in terms of which safe shutdown function they support and which potential alternate safe shutdown systems are considered equivalent. These systems are not categorized into potential success "paths" but are considered on a "train" (division) basis or are discussed in terms of one or more systems performing the same function as another system (alternate or backup). Support systems are identified for each train or "alternate" system. Each safe shutdown system and support system is listed in the Safe Shutdown Component List, Appendix A, along with all of its required components. The "train" that the component supports is identified.

This FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-2 Nuclear Safety Capability Assessment
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NEI 00-01 Section:

3.1.3.4 - Assign Shutdown Paths to Each Combination of Systems

Alignment Statement: Aligns

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 for an example of a table illustrating how to document the various combinations of systems for selected shutdown paths.

Alignment Basis:

FHAR Section 3.6, Safe Shutdown Systems, describes the systems in terms of what safe shutdown function they support and which potential alternate safe shutdown systems are considered equivalent. These systems are not categorized into potential success "paths" but are considered on a "train" (division) basis or are discussed in terms of one or more systems performing the same function as another system (alternate or backup). Support systems are identified for each train or "alternate" system. Each safe shutdown system and support system is listed in the Safe Shutdown Component List, Appendix A, along with all of its required components. The "train" that the component supports is identified.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2 - Safe Shutdown Equipment Selection

Alignment Statement: Aligns

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 functions. 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 mal-operation of the safe shutdown systems. For each path it will be important to understand which components are classified as required safe shutdown components and which are classified as important to safe shutdown components. When evaluating the fire-induced impact to each affected cable/component in each fire area, this classification dictates the tools available for mitigation the affects.

Alignment Basis:

FHAR discusses the method of selection of safe shutdown components at Davis-Besse. A review of plant shutdown requirements was performed to identify those systems needed to provide reactivity control, reactor coolant makeup, and reactor heat removal when achieving Hot Shutdown and when subsequently achieving Cold Shutdown. Those systems needed to monitor process variables (level, flow, etc.), those systems needed to provide support functions (cooling, lubrication, etc.) and those systems which could cause automatic actuation (i.e., SFRCS, SFAS) of these systems were also identified. All such systems were included as safe shutdown systems. A review of the plant Piping and Instrument Diagrams (P&IDs) was then performed to identify the components within these systems that are required to achieve each safe shutdown function. The components identified during this review were placed on the Safe Shutdown Component List (SSCL). For each component identified in the SSCL that has an electrical interface, a review of its Elementary Wiring Diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuits/cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer, motor heater, and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

Using the criteria from Appendix H of NEI 00-01, Revision 2 to classify each impacted cable/component as either a "Required" or "Important to SSD cable/component" is part of the methodology used to determine if an Operator Manual Action is permitted or another resolution is required to resolve MSOs and comply with the requirement of Appendix R 10CFR50. The classifications were not industry standards or regulatory requirements at the time the component identification and cable selection was performed for the Davis-Besse fire area evaluations. Therefore, cables and components were not classified as "Required for safe shutdown" or "Important for safe shutdown". This does not impact the FHAR selection of systems, equipment, cables, and the identification of their location for use in the transitioning nuclear safety analysis. The FHAR identifies a "justification" when the protection of cables and/or components in a fire area of systems whose function is required for Hot Shutdown does not meet Appendix R requirements.

FHAR methodology is consistent with the guidance provided in NEI 00-01 Rev 2.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.1 - Criteria/Assumptions

Alignment Statement: Aligns

Consider the following criteria and assumptions when identifying equipment necessary to perform the required safe shutdown functions:

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.1.1 - Safe Shutdown Equipment Categories

Alignment Statement: Aligns

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:
• Pumps, motor operated valves, solenoid valves, fans, gas bottles, dampers, unit coolers, etc.
• All necessary process indicators and recorders (i.e., flow indicator, temperature indicator, turbine speed indicator, pressure indicator, level recorder)
• 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.

Alignment Basis:

FHAR Section 3.8, Safe Shutdown System Circuits, describes the methodology used for circuit identification for Safe Shutdown Components.

Section 3.8.1 Introduction

The safe shutdown components list (SSCL) was the basic input for the identification of electrical circuits essential for proper equipment performance. The circuits identified included those for power, control, and instrumentation.

Section 3.8.2 Methodology

The following is a discussion of the steps that were performed to identify the safe shutdown circuits and their routings throughout the plant.

1. For each component identified in the SSCL (Appendix A) that has an electrical interface, a review of its elementary wiring diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuits/cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer, motor heater and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

FHAR Appendix A- Safe Shutdown Component List

Appendix A of the FHAR contains the primary components required for safe shutdown. Secondary components are included and assessed during the circuit analysis selection and evaluation steps.

FHAR Appendix B-1- Circuit/Component Location Summary By System

A review of Appendix B-1 of the FHAR shows that for every primary component there is a column labeled CIRCUIT/SUB-COMP which lists the applicable secondary or subcomponents in addition to the circuits.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.1.2 - Manual Valves and Piping

Alignment Statement: Aligns with Intent

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. For example, post-fire coefficients of friction for rising stem valves cannot be readily determined. Handwheel sizes and rim pulls are based on well lubricated stems. Any post-fire operation of a rising stem valve should be well justified using an engineering evaluation.

Alignment Basis:

FHAR Section 4.0 describes the assumptions, requirements, methodology, and contains the results of the fire area evaluation performed to demonstrate compliance with Appendix R, Section III.G.

Section 4.3 Assumptions

2. Passive mechanical components are assumed to remain available after a fire; these components include heat exchangers, manual, relief, and check valves, piping, and tanks.

For transition to NFPA 805, feasibility and reliability of credited manual actions is evaluated and discussed in LAR Attachment G.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.1.3 - Valves in Normal Position

Alignment Statement: Aligns

Assume that all components, including manual valves, are in their normal position as shown on P&IDs or in the plant operating procedures, that there are no LCOs in effect, that the Unit is operating at 100% power and that no equipment has been taken out of service for maintenance.

Alignment Basis:

FHAR Section 3.4 identifies the requirements and assumptions that must be met to demonstrate safe shutdown capability.

Section 3.4.2 Assumptions

1. At the onset of a fire, both trains of systems required operable for safe shutdown are functional (i.e., none of the safe shutdown system components, except spare or standby components are assumed to be under maintenance or test.)

2. The plant is operating at 100 percent power.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.2.1.4 - Check Valves

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 4.0, Appendix R, Section III.G Evaluation, evaluates the fire protection features that assure safe shutdown capability as required by Section III. G of Appendix R to 10 CFR 50. The components and circuits required for safe shutdown were identified by the methodology described in Section 3.

Section 4.3 Assumptions

2. Passive mechanical components are assumed to remain available after a fire; these components include heat exchangers, manual, relief, and check valves, piping, and tanks.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.2.1.5 - Instrument Failure

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 3.4 identifies the requirements and assumptions that must be met to demonstrate safe shutdown capability.

Section 3.4.1 Requirements

7. Those components whose spurious operation (due to the fire) would threaten safe shutdown system capability are identified and evaluated.

Section 3.4.2 Assumptions

3. For the purpose of developing the safe shutdown components list (SSCL), it was conservatively assumed that the fire-induced failure of circuits for all safe shutdown components (including spurious components) causes the component to assume the most detrimental position for proper operation of the safe shutdown system.

FHAR Section 4.0, Appendix R, Section III.G Evaluation, evaluates the fire protection features that assure Safe Shutdown capability as required by Section III.G of Appendix R to 10 CFR 50. The components and circuits required for safe shutdown were identified by the methodology described in Section 3.

Section 4.3 Assumptions

1. The availability of component status indication need not be assured. Each indicating circuit is, however, to be assessed for potential impact on the ability of the components to perform its function.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.2 - Methodology for Equipment Selection

Alignment Statement: Aligns

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:

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.2.1 - Identify the System Flow Path for Each Shutdown Path

Alignment Statement: Aligns

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. When developing the SSEL, 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.

Alignment Basis:

FHAR Section 3.5 identifies the methodology used to identify a minimum set of plant systems (safe shutdown systems) and component necessary to achieve the functional goal and ensure compliance to the requirements of Appendix R.

3.5.2 Methodology

A review of plant shutdown requirements was performed to identify those systems needed to provide reactivity control, reactor coolant makeup, and reactor heat removal when achieving Hot Shutdown and when subsequently achieving Cold Shutdown. Those systems needed to monitor process variables (level, flow, etc.), those systems needed to provide support functions (cooling, lubrication, etc.) and those systems which could cause automatic actuation (i.e., SFRCS, SFAS) of these systems were also identified. All such systems were included as Safe Shutdown Systems.

A review of the plant Piping and Instrument Diagrams (P&ID's) was then performed to identify the components within these systems that are required to achieve each safe shutdown function.

FHAR Appendix A, Safe Shutdown Component List, provides a detailed list of the systems and components.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.2.2 - Identify the Equipment in Each Safe Shutdown System Flow Path Including Equipment That May Spuriously Operate and Affect System Operation

Alignment Statement: Aligns with Intent

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. Additionally, refer to Section 4 for the Resolution Methodology for determining the Plant Specific List of MSOs requiring evaluation. Criteria for making the determination as to which of these components are to be classified as required for hot shutdown or as important to SSD is contained in Appendix H. If additional systems are identified which are necessary for the operation of the safe shutdown system under review, include these as required for hot shutdown systems. Designate these new systems with the same safe shutdown path as the primary safe shutdown system under review (Refer to Figure 3-1).

Alignment Basis:

FHAR Section 3.7 identifies methodology used for the selection of safe shutdown components. The safe shutdown components list (SSCL) is contained in Appendix A of the FHAR.

Section 3.7.2 Methodology

For the Safe Shutdown Systems established in Section 3.6, the following steps were utilized in developing a list of Safe Shutdown components:

1. All active and passive components that are required to function were identified from the P&IDS.

2. The normal flowpaths for those systems identified as safe shutdown systems were traced on the P&IDS.

(a) Minimum Complement - Those components identified on the main path such as pumps, valves, blowers, and dampers, which are required to function in order to achieve the system function.

(b) Alternate - Any piece of equipment which does not normally perform that function but can be used as a substitute for another component and still achieve the system function.

(c) Backup - Any piece of equipment whose primary purpose is to provide the same function as a necessary piece of equipment under consideration.

(d) Spurious Actuation - Any component that could spuriously actuate in a position detrimental to proper system operation (either on the main flowpath or branch lines), or whose maloperation could result in a breach of the reactor coolant boundary. Branching lines coming off of the main path that could provide flow diversion were traced to identify those components providing isolation for the main path.

(e) The term "High/Low Pressure Interfaces" refers to those components which, as a result of a malfunction, may result in the inadvertent blowdown of RCS inventory to a low pressure region such as a low pressure pipe, tank or containment atmosphere. Generic Letter 81-12 and Generic Letter 86-10 provide guidance
on evaluating these components. The evaluations are found in the fire area sections. These components are listed as "H/L" Components in Appendix A.

The following are High/Low Pressure Interface Valves:

DH11
DH12
RC11
RC2A
RC200
RC239A, B
RC4608A, B
RC4610A, B
RC4632

3. The minimum instrumentation necessary to satisfy the requirements of Appendix R was identified.

4. The minimum components required for assuring essential power to energize safe shutdown components in the event of a Loss Of Offsite Power (LOOP) were identified.

While the FHAR methodology is consistent with the guidance provided in NEI 00-01, and Davis-Besse aligns with the intent of the guidance, during the transition to NFPA 805, the plant-specific list of MSOs requiring additional evaluation was reviewed in accordance with guidance provided in FAQ 07-0038.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FAQ 07-0038, Rev. 3, "Lessons learned on Multiple Spurious Operations (ML110140242)"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.2.3 - Develop a List of Safe Shutdown Equipment and Assign the Corresponding System and Safe Shutdown Path(s) Designation to Each

Alignment Statement: Aligns

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. Criteria for making the determination as to which of these components are to be classified as required for hot shutdown or as important to SSD is contained in Appendix H. 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 post-fire safe shutdown and it documents various equipment-related attributes used in the analysis.

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.

Alignment Basis:

FHAR Section 3.7 identifies methodology used for the selection of safe shutdown components. The SSCL is contained in Appendix A of the FHAR.

Section 3.7.1 Introduction

Section 3.6 describes the specific systems which will be utilized to achieve safe shutdown. This section discusses the method of selection of safe shutdown components. An SSCL is included as Appendix A to this report.

Section 3.7.2 Methodology

For the Safe Shutdown Systems established in Section 3.6, the following steps were utilized in developing a list of Safe Shutdown components:

1. All active and passive components that are required to function were identified from the P&IDS.

2. The normal flowpaths for those systems identified as safe shutdown systems were traced on the P&IDS.

(a) Minimum Complement - Those components identified on the main path such as pumps, valves, blowers, and dampers, which are required to function in order to achieve the system function.

(b) Alternate - Any piece of equipment which does not normally perform that function but can be used as a substitute for another component and still achieve the system function.

(c) Backup - Any piece of equipment whose primary purpose is to provide the same function as a necessary piece of equipment under consideration.

(d) Spurious Actuation - Any component that could spuriously actuate in a position detrimental to proper system operation (either on the main flowpath or branch lines), or whose maloperation could result in a breach of the reactor coolant boundary. Branching lines coming off of the main path that could provide flow diversion were traced to identify those components providing isolation for the main path.

(e) The term "High/Low Pressure Interfaces" refers to those components which, as a result of a malfunction, may result in the inadvertent blowdown of RCS inventory to a low pressure region such as a low pressure pipe, tank or containment atmosphere. Generic Letter 81-12 and Generic Letter 86-10 provide guidance on evaluating these components. The evaluations are found in the fire area sections. These components are listed as "H/L" Components in Appendix A.

The following are High/Low Pressure Interface Valves:
DH11
DH12
RC11
RC2A
RC200
RC239A,B
RC4608A,B
RC4610A B
RC4632

3. The minimum instrumentation necessary to satisfy the requirements of Appendix R was identified.

4. The minimum components required for assuring essential power to energize SAFE.

This FHAR methodology is consistent with the guidance provided in NEI 00-01 with the following exception:

For applicable credited instrumentation, the identification of associated instrument tubing for evaluation was not described as a criteria or part of the methodology for safe shutdown component identification at Davis-Besse. A separate evaluation was subsequently performed during the transition to NFPA 805. That evaluation, ARS-DB-11-016, reviewed process instrumentation components and tubing and documented the analysis of the post-fire damage status for the equipment of interest.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- ARS-DB-11-016, Rev. 2, "Instrument Tubing Analysis"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.2.4 - Identify Equipment Information Required for the Safe Shutdown Analysis

Alignment Statement: Aligns

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. Criteria for making the determination as to which of these components are to be classified as required for hot shutdown or as important to SSD is contained in Appendix H.

Alignment Basis:

The FHAR Appendix A contains the safe shutdown component list. The related equipment data include the equipment type, equipment description, and safe shutdown system, safe shutdown path, drawing reference, fire area location of equipment, normal position, hot shutdown position, cold shutdown position, failed air position, failed electrical position, high/low pressure interface concern, and spurious operation concern.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.2.2.5 - Identify Dependencies Between Equipment, Supporting Equipment, Safe Shutdown Systems and Safe Shutdown Paths

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 3.7 identifies methodology used for the selection of safe shutdown components and their relationship to the safe shutdown systems. The safe shutdown components list (SSCL) is contained in Appendix A of the FHAR.

Section 3.7.2 Methodology

For the safe shutdown systems established in Section 3.6, the following steps were utilized in developing a list of safe shutdown components:

1. All active and passive components that are required to function were identified from the P&IDS.

2. The normal flowpaths for those systems identified as safe shutdown systems were traced on the P&IDS.

(a) Minimum Complement - Those components identified on the main path such as pumps, valves, blowers, and dampers, which are required to function in order to achieve the system function.

(b) Alternate - Any piece of equipment which does not normally perform that function but can be used as a substitute for another component and still achieve the system function.

(c) Backup - Any piece of equipment whose primary purpose is to provide the same function as a necessary piece of equipment under consideration.

(d) Spurious Actuation - Any component that could spuriously actuate in a position detrimental to proper system operation (either on the main flowpath or branch lines), or whose maloperation could result in a breach of the reactor coolant boundary. Branching lines coming off of the main path that could provide flow diversion were traced to identify those components providing isolation for the main path.

(e) The term "High/Low Pressure Interfaces" refers to those components which, as a result of a malfunction, may result in the inadvertent blowdown of RCS inventory to a low pressure region such as a low pressure pipe, tank or containment atmosphere. Generic Letter 81-12 and Generic Letter 86-10 provide guidance on evaluating these components. The evaluations are found in the fire area sections. These components are listed as "H/L" components in Appendix A.

The following are High/Low Pressure Interface Valves:
- DH11
- DH12
- RC11
- RC2A
- RC200
- RC239A, B
- RC4608A, B
- RC4610A, B
- RC4632

3. The minimum instrumentation necessary to satisfy the requirements of Appendix R was identified.

4. The minimum components required for assuring essential power to energize safe shutdown components in the event of a loss of offsite power (LOOP) were identified.

This FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

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 fireinduced 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 Section:

3.3 - Safe Shutdown Cable Selection and Location

Alignment Statement: Aligns

This section provides industry guidance on one acceptable approach 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 mal-operation 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. The classification of a cable as either an important to SSD circuit cable or a required safe shutdown cable is also derived from the classification applied to the component that it supports. This classification can vary from one fire area to another depending on the approach used to accomplish post-fire safe shutdown in the area. Refer to Appendix H for the criteria to be used for classifying required and important to SSD components.

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance contained in NEI 00-01.

Using the criteria from Appendix H of NEI 00-01, Rev. 2 to classify each impacted cable/component as either a "Required" or "Important to SSD cable/component" is part of the methodology used to determine if an Operator Manual Action is permitted or another resolution is required to resolve MSOs and comply with the requirement of Appendix R 10CFR50. The classifications were not industry standards or regulatory requirements at the time the component identification and cable selection was performed for the Davis-Besse fire area evaluations. Therefore, cables and components were not classified as "required for safe shutdown" or "important for safe shutdown". This does not impact the FHAR selection of systems, equipment, cables and the identification of their location for use in the transitioning nuclear safety analysis. The FHAR identifies a "justification" when the protection of cables and/or components in a fire area of systems whose function is required for Hot Shutdown does not meet Appendix R requirements.

FHAR methodology is consistent with the guidance provided in NEI 00-01, Rev. 2.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.1 - Criteria/Assumptions

Alignment Statement: Aligns

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 components, systems and functions.

Consider the following criteria when selecting cables that impact safe shutdown equipment:

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance contained in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.1.1.1 - Cable Failures

Alignment Statement: Aligns

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. Review 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.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control, and instrumentation required to ensure proper operations of safe shutdown systems and components.

3.8.2 Methodology

The following is discussion of the steps that were performed to identify the Safe Shutdown circuits and their routings throughout the plant:

1. For each component identified in the SSCL (Appendix A) that has an electrical interface, a review of its Elementary Wiring Diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuit cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer, motor heater and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

The FHAR methodology is consistent with NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.1.1.2 - Cable Failures Affecting Multiple Safe Shutdown Equipment

Alignment Statement: Aligns

In cases where the failure (including spurious operations) of a single cable could impact more than one piece of safe shutdown equipment, associate the cable with each piece of safe shutdown equipment.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control, and instrumentation required to ensure proper operations of safe shutdown Systems and Components.

3.8.2 Methodology

The following is discussion of the steps that were performed to identify the safe shutdown circuits and their routings throughout the plant:

1. For each component identified in the SSCL (Appendix A) that has an electrical interface, a review of its Elementary Wiring Diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuit cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer, motor heater, and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

The FHAR methodology is consistent with NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.1.1.2.1 - Electrical Isolation Devices

Alignment Statement: Aligns

Electrical devices such as relays, switches and signal resistor units are considered to be acceptable isolation devices. In the case of instrument loops and electrical metering circuits, 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. Refer to Section 3.5 for the types of faults that should be considered when evaluating the acceptability of the isolation device being credited.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control, and instrumentation required to ensure proper operations of safe shutdown systems and components.

3.8.2 Methodology

The following is a discussion of the steps that were performed to identify the safe shutdown circuits and their routings throughout the plant

1. For each component identified in the SSCL (Appendix A) that has an electrical interface, a review of its Elementary Wiring Diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuit cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer, motor heater, and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

The FHAR methodology is consistent with NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.1.1.3 - Screening Out Cables with No Impact

Alignment Statement: Aligns

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. To be properly screened out, however, the circuits associated with these devices 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. Refer to Section 3.5 for the types of faults that should be considered when evaluating the acceptability of the isolation device being credited.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control, and instrumentation required to ensure proper operations of safe shutdown systems and components.

3.8.2 Methodology

The following is a discussion of the steps that were performed to identify the safe shutdown circuits and their routings throughout the plant:

1. For each component identified in the SSCL (Appendix A) that has an electrical interface, a review of its Elementary Wiring Diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuit cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer. motor heater and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

The FHAR methodology is consistent with NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.1.1.4 - Power Supply to Safe Shutdown Equipment

Alignment Statement: Aligns

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. The set of cables described above are classified as required safe shutdown cables. Evaluate the power cables for breaker coordination concerns. The non-safe shutdown cables off of the safe shutdown buses are classified as required for hot shutdown or as important to SSD based on the criteria contained in Appendix H.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control and instrumentation required to ensure proper operations of safe shutdown systems and components.

3.8.2 Methodology

The following is discussion of the steps that were performed to identify the safe shutdown circuits and their routings throughout the plant:

1. For each component identified in the SSCL (Appendix A) that has an electrical interface, a review of its Elementary Wiring Diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuit cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer, motor heater, and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

The FHAR methodology is consistent with NEI 00-01 guidance.FHAR Section 5.0 describes the method of evaluation of “Associated” circuits whose fire-induced failure could prevent operation or cause maloperation of Shutdown systems and equipment. The identification of these associated circuits of concern was performed in accordance with NRC Generic Letter 81-12 and the staff's clarification to the Generic Letter.

Section 5.1 Common Power Source Analysis

5.1.1 Introduction

The electrical distribution system was reviewed to ensure that acceptable coordination and selective tripping is provided for all circuits in the Essential Power System. The review was limited to circuits supplied from power sources which feed loads required for safe shutdown.

The power sources reviewed are as follows:

O	4160V AC	Switchgears C1, C2, D1 and D2
O	480V AC	Essential Unit Substations E1 and F1
O	480V AC	Unit Substation F7
O	480V AC	Essential Motor Control Centers
O	250/125V DC	Essential Motor Control Centers DC MCC 1 and DC MCC 2
O	240/120V AC	Essential MCC YE1, YE2, YF1, YF2
O	125V DC	Essential Distribution Panels D1P, D1N, D2P and D2N
O	125V DC	Distribution Panels DAP, DAN, DBP and DBN
O	120V AC	Essential Instrumentation Distribution Panels Y1, Y2, Y3 and Y4
O	120V AC	Uninterruptable Instrumentation Distribution Panels YAU and YBU
O	Cabinets	Cabinets & Panel used as power supply panels

For breaker coordination, Appendix C-3 Note 8:

GENERAL NOTE: Due to implementation of FCR 85-0063, the 480V level has been adequately coordinated for safe shutdown, see the "480V Breaker Coordination to Meet Common Power Source Criteria of Appendix R (Calculation C-EE-0 13.10-00 1)." Cables associated with breakers that will lhave the automatic trip function removed are listed in Appendix C-3 and are protected by the upstream breakers.

The FHAR methodology is consistent with NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- C-EE-013.10-001, Rev. 1, "480V Breaker Coordination to Meet Common Power Source Criteria for Appendix R"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.1.1.4.1 - Automatic Initiation Logics

Alignment Statement: Aligns with Intent

The automatic initiation logics for the credited post-fire safe shutdown systems are generally not required to support safe shutdown. Typically, each system can be controlled manually by operator actuation in the main control room or emergency control station. The emergency control station includes those plant locations where control devices, such as switches, are installed for the purpose of operating the equipment. If operator actions to manually manipulate equipment at locations outside the MCR or the emergency control station are necessary, those actions must conform to the regulatory requirements on operator manual actions (See Appendix E). If not protected from the effects of fire, the fire-induced failure of automatic initiation logic circuits should be considered for their potential to adversely affect any post-fire safe shutdown system function.

Alignment Basis:

For the FHAR, only manual initiation of systems required to achieve and maintain safe shutdown is credited. Automatic initiation of systems required to achieve and maintain safe shutdown (i.e., SFRCS, SFAS actuation signal initiation) is not credited. However, fire-induced automatic initiation signals are evaluated for the possibility of spurious component operation and their subsequent adverse impact on safe shutdown.

The Davis-Besse safe shutdown analysis was performed based on the assumption that manual initiation from the main control room or emergency control stations of systems required to achieve and maintain safe shutdown is acceptable. This assumption was not based on the current guidance in Appendix E of NEI 00-01, Rev. 2 since it did not exist at that time. Operator manual actions (OMAs) were evaluated during the transition to NFPA 805 per the guidance provided in NEI 00-01 and NEI 04-02.

FHAR Section 3.5 identifies methodology used to identify a minimum set of plant systems (Safe Shutdown Systems) and components necessary to achieve the functional goal and ensure compliance with the requirements of Appendix R.

3.5.2 Methodology

A review of plant shutdown requirements was performed to identify those systems needed to provide reactivity control, reactor coolant makeup, and reactor heat removal when achieving Hot Shutdown and when subsequently achieving Cold Shutdown. Those systems needed to monitor process variables (level, flow, etc.), those systems needed to provide support functions (cooling, lubrication, etc.), and those systems which could cause automatic actuation (i.e., SFRCS, SFAS) of these systems were also identified. All such systems were included as Safe Shutdown Systems.

This FHAR methodology predates and is not consistent with the updated guidance provided in NEI 00-01 Rev 2.

Pre-transition operator actions will be transitioned as recovery actions consistent with approved guidance set forth in NEI 04-02 and applicable FAQs.

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.3.1.1.5 - Associated Circuits **Alignment Statement:** Aligns

Cabling for the electrical distribution system is a concern for those breakers that feed 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 and classified as a required safe shutdown cable. 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. Additionally, the non-safe shutdown circuits off of each of the required safe shutdown components in the electrical distribution system can impact safe shutdown if not properly coordinated. These cables are classified as required for hot shutdown based on the criteria contained in Appendix H.

Alignment Basis:

FHAR Section 5.0 describes the evaluation of “Associated” circuits whose fire-induced failure could prevent operation or cause maloperation of shutdown systems and equipment. The identification of these associated circuits of concern was performed in accordance with NRC Generic Letter 81-12 and the staff's clarification to the Generic Letter. The letter further defined associated circuits of concern as those cables that:

1. Have physical separation less than that required by Section III.G.2 of Appendix R, and;

2. Have one of the following:

a. A common power source with the shutdown equipment (redundant or alternative) and the power source is not electrically protected from the circuit of concern by coordinated breakers, fuses, or similar devices: or

b. A connection to circuits of equipment whose spurious operation would adversely affect the shutdown capability or:

c. A common enclosure (e. g., raceway, panel, junction box) with the shutdown cables, and:

1. Are not electrically protected by circuit breakers, fuses or similar devices, or

2. Will allow propagation of the fire into the common enclosure.

The evaluation of possible spurious operation of equipment was included in the circuit analysis performed for Safe Shutdown equipment as documented in Section 4.

The FHAR methodology is consistent with NEI 00-01 guidance.

Table B-2 Nuclear Safety Capability Assessment
Methodology Review
Transition Report

Davis-Besse

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.3.1.1.6 - Exclusion Analysis

Alignment Statement: Not Applicable

Exclusion analysis may be used to demonstrate a lack of potential for any impacts to post-fire safe shutdown from a component or group of components regardless of the cable routing. For these cases, rigorous cable searching and cable to component associations may not be required.

Alignment Basis:

Exclusion analysis was not used to demonstrate a lack of potential for any impacts to post-fire safe shutdown.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.2 - Associated Circuit of Concern Cables **Alignment Statement:** Aligns

Appendix R, through the guidance provided in NRC Generic Letter 81-12, requires that separation features be provided for associated non-safety circuits that could prevent operation or cause mal-operation 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 7.1.5 and further clarified in a NRC memorandum dated March 22, 1982 from R. Mattson to D. Eisenhut, Reference 7.1.6. They are as follows:
• Spurious actuations4
• Common power source
• Common enclosure.

4 As explained in NRC RIS 2005-30 and in Appendix H, components whose spurious operations could directly prevent the required safe shutdown path in any fire area from performing its required hot shutdown function are classified as required for hot shutdown components. Components whose spurious operation could affect important to safe shutdown components might be associated circuits of concern for spurious actuation.

Each of these cables is classified as an associated circuit of concern cable.

Cables Whose Failure May Cause Spurious Operations

Safe shutdown system spurious operation concerns can result from fire damage to a cable whose failure could cause the spurious operation/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.

Common Power Source Cables

The concern for the common power source associated circuits of concern 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.

Common Enclosure Cables

The concern with common enclosure associated circuits of concern 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.

Alignment Basis:

FHAR Section 5.0 describes the evaluation of “Associated” circuits whose fire-induced failure could prevent operation or cause maloperation of shutdown systems and equipment. The identification of these Associated Circuits of Concern was performed in accordance with NRC Generic Letter 81-12 and the Staff's Clarification to the Generic Letter. The letter further defined associated circuits of concern as those cables that:

1. Have physical separation less than that required by Section III.G.2 of Appendix R, and;

2. Have one of the following:

a. A common power source with the shutdown equipment (redundant or alternative) and the power source is not electrically protected from the circuit of concern by coordinated breakers, fuses, or similar device, or:

b. A connection to circuits of equipment whose spurious operation would adversely affect the shutdown capability or:

c. A common enclosure (e. g., raceway, panel, junction box) with the shutdown cables, and:

1. Are not electrically protected by circuit breakers, fuses, or similar devices, or

2. Will allow propagation of the fire into the common enclosure.

The evaluation of possible spurious operation of equipment was included in the circuit analysis performed for Safe Shutdown equipment as documented in Section 4.

The FHAR methodology is consistent with NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.3 - Methodology for Cable Selection and Location

Alignment Statement: Aligns

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 be circuits of concerns for a post-fire safe shutdown analysis. Criteria for making the determination as to which circuits are to be classified as required for hot shutdown or as important to SSD is contained in Appendix H.

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.3.1 - Identify Circuits Necessary for the Operation of the Safe Shutdown Equipment **Alignment Statement:** Aligns

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:
• Single-line electrical diagrams
• Elementary wiring diagrams
• Electrical connection diagrams
• 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.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control, and instrumentation required to ensure proper operations of Safe Shutdown Systems and Components.

Section 3.8.2 Methodology

The following is discussion of the steps that were performed to identify the Safe Shutdown circuits and their routings throughout the plant

1. For each component identified in the SSCL (Appendix A) that has an electrical interface, a review of its Elementary Wiring Diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuit cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer. motor heater and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

FHAR Section 5.0 describes the evaluation of “Associated” circuits whose fire-induced failure could prevent operation or cause maloperation of shutdown systems and equipment. The identification of these Associated Circuits of concern was performed in accordance with NRC Generic Letter 81-12 and the staff's clarification to the Generic Letter.

Section 5.1.2 Methodology

The safe shutdown components in Appendix A are evaluated to determine if power to the component is required for safe shutdown. If power is required, then associated circuits that share this common power source are evaluated. The method of evaluation depends on the power source.

The FHAR methodology is consistent with NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.3.2 - Identify Interlocked Circuits and Cables Whose Spurious Operation or Mal-operation Could Affect Shutdown

Alignment Statement: Aligns

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 in an undesirable manner that impacts post-fire safe shutdown.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control and instrumentation required to ensure proper operations of Safe Shutdown Systems and Components.

Section 3.8.2 Methodology

The following is discussion of the steps that were performed to identify the Safe Shutdown circuits and their routings throughout the plant

1. For each component identified in the SSCL (Appendix A) which has an electrical interface, a review of its Elementary Wiring Diagram (EWD) was performed. The block diagram for each component identifies all circuits related to that component. For each component, all circuit cables that ensure operability of the component were identified as required for safe shutdown. Those circuits that are not required for safe shutdown include annunciator, computer. motor heater, and external monitoring circuits that are electrically isolated from the electrical circuits of concern.

4.6._.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited Train, as well as the disposition of each, are identified. It provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

4.6._.6 TABLE 1 Detailed Analysis Column 13 identifies circuit interlocks.

13. Interlock - Identifies various circuit interlocks.

The FHAR methodology is consistent with the guidance provided in NEI 00-01 guidance.

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.3.3.3 - Assign Cables to the Safe Shutdown Equipment

Alignment Statement: Aligns with Intent

Given the criteria/assumptions defined in Section 3.3.1, identify the cables required to operate or that may result in mal-operation of each piece of safe shutdown equipment. Cables are classified as either required for hot shutdown or important to SSD based on the classification of the component to which they are associated and the function of that component in supporting post fire safe shutdown in each particular fire area. Refer to Appendix H for additional guidance.

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. Criteria for making the determination as to which cables are to be classified as required for hot shutdown or as important to SSD is contained in Appendix H.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control, and instrumentation required to ensure proper operations of safe shutdown systems and components.

Section 3.8.2 Methodology

The following is a discussion of the steps that were performed to identify the safe shutdown circuits and their routings throughout the plant:

4. The tracing of all safe shutdown circuits culminated in the development of a database that identifies all raceway routings (by fire area) for all circuits associated with safe shutdown components.

   From this database, the "Circuit/Subcomponent Location Summary by System" (Appendix B-1) was generated, which includes the following data in a column listing:

   a. System performing the safe shutdown function

   b. Component, and circuits for the component

   c. Circuit description

   d. Fire area in which the component and circuits are located

e. Raceway, conduit, or cable tray identification

f. Electrical raceway and/or raceway and grounding drawing reference

5. The computer database listing of components, conduits, and cable trays was then sorted to list the components and circuits within each fire area by system. This resulted in the circuit/Subcomponent Location Summary by Fire Areas (Appendix B-2).

Although the database does not reference the drawing revision numbers used for the analysis, the FHAR methodology is consistent with the intent of the NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.5 - Circuit Analysis and Evaluation

Alignment Statement: Aligns

This section on circuit analysis provides information on the potential impact of fire on circuits used to monitor, control and power required for hot shutdown and important to 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. Additionally, when assessing fire-induced damage to circuits that could potentially result in MSOs, the circuit failure criteria in Appendix B should be used.

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.

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Using the criteria from Appendix H of NEI 00-01, Rev. 2 to classify each impacted cable/component as either a "Required" or "Important to SSD" cable/component is part of the methodology used to determine if an operator manual action is permitted or if another resolution is required to resolve MSOs and comply with the requirement of Appendix R 10 CFR 50. The classifications were not industry standards or regulatory requirements at the time the component identification and cable selection was performed for the Davis-Besse fire area evaluations. Therefore, cables, and components were not classified as "Required for safe shutdown" or "Important for Safe Shutdown." This does not impact the FHAR selection of systems, equipment, cables, and the identification of their location for use in the transitioning nuclear safety analysis. The FHAR identifies a "justification" when the protection of cables and/or components in a fire area of systems whose function is required for Hot Shutdown does not meet Appendix R requirements.

FHAR methodology is consistent with the guidance provided in NEI 00-01, Rev. 2.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.5.1 - Criteria/Assumptions

Alignment Statement: Aligns

Apply the following criteria/assumptions when performing fire-induced circuit failure evaluations. Refer to the assessment of the NEI/EPRI and CAROLFIRE Cable Test Results in Appendix B to this document for the basis for these criteria and for further elaboration on the application of the criteria.

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance and references to the applicable Davis-Besse documents are provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.5.1.1 - Circuit Failure Criteria

Alignment Statement: Aligns with Intent

Circuit Failure Criteria: The criteria provided below addresses the effects of multiple fire-induced circuit failures impacting circuits for components classified as either "required for hot shutdown" or "important to safe shutdown". Consider the following circuit failure types on each conductor of each unprotected cable. Criteria differences, however, do apply depending on whether the component is classified as required for hot shutdown or important to safe shutdown.

• 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.
• A hot short in the control circuitry for an MOV can bypass the MOV protective devices, i.e. torque and limit switches. This is the condition described in NRC Information Notice 92-18. In this condition, the potential exists to damage the MOV motor and/or valve. Damage to the MOV could result in an inability to operate the MOV either remotely, using separate controls with separate control power, or manually using the MOV hand wheel. This condition could be a concern in two instances: (1) For fires requiring Control Room evacuation and remote operation from the Remote Shutdown Panel, the Auxiliary Control Panel or Auxiliary Shutdown Panel; (2) For fires where the selected means of addressing the effects of fire induced damage is the use of an operator manual action. In each case, analysis must be performed to demonstrate that the MOV can be subsequently operated electrically or manually, as required by the safe shutdown analysis.
• 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: Open circuits as a result of conductor melting have not occurred in any of the recent cable fire testing and they are not considered to be a viable form of cable failure.]
• 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. A short-to-ground may also result in a change of state for normally energized equipment.

Circuits for "required for hot shutdown" components: Because Appendix R Section III.G.1 requires that the hot shutdown capability remain "free of fire damage", there is no limit on the number of concurrent/simultaneous fire-induced circuit failures that must be considered for circuits for components "required for hot shutdown" located within the same fire area. For components classified as "required for hot shutdown", there is no limit on the duration of the hot short. It must be assumed to exist until an action is taken to mitigate its effects. Circuits required for the operation of or that can cause the mal-operation of "required for hot shutdown" components that are impacted by a fire are considered to render the component unavailable for performing its hot shutdown function unless these circuits are properly protected as described in the next sentence. The required circuits for any "required for hot shutdown" component, if located in the same fire area where they are credited for achieving hot shutdown, must be protected in accordance with one of the requirements of Appendix R Section III.G.2 or plant specific license conditions.

Circuits for "important to safe shutdown" components: Circuits for components classified as "important to safe shutdown" are not specifically governed by the requirements of Appendix R Section III.G.1, III.G.2 or III.G.3. To address fire-induced impacts on these circuits, consider the three types of circuit failures identified above to occur individually on each conductor with the potential to impact any "important to safe shutdown" component with the potential to impact components "required for hot shutdown". In addition, consider the following additional circuit failure criteria for circuits for "important to safe shutdown" components located within the same fire area with the potential to impact components "required for hot shutdown":

• As explained in Figure 3.5.2-3, multiple shorts-to-ground are to be evaluated for their impact on ungrounded circuits.
• As explained in Figure 3.5.2-5, for ungrounded DC circuits, a single hot short from the same source is assumed to occur unless it can be demonstrated that the occurrence of a same source short is not possible in the affected fire area. If this approach is used, a means to configuration control this condition must be developed and maintained.
• For the double DC break solenoid circuit design discussed in the NRC Memo from Gary Holahan, Deputy Director Division of Systems Technology, dated December 4, 1990 and filed under ML062300013, the effect of two hot shorts of the proper polarity in the same multi-conductor cable should be analyzed for non-high low pressure interface components. [Reference Figure B.3.3 (f) of NFPA 805- 2001.]
• Multiple spurious operations resulting from a fire-induced circuit failure affecting a single conductor must be included in the post-fire safe shutdown analysis.
• Multiple fire-induced circuit failures affecting multiple conductors within the same multi-conductor cable with the potential to cause a spurious operation of an "important to safe shutdown" component must be assumed to exist concurrently.
• Multiple fire-induced circuit failures affecting separate conductors in separate cables with the potential to cause a spurious operation of an "important to safe shutdown" component must be assumed to exist concurrently when the effect of the fire-induced circuit failure is sealed-in or latched.
• Conversely, multiple fire-induced circuit failures affecting separate conductors in separate cables with the potential to cause a spurious operation of an "important to safe shutdown" component need not be assumed to exist concurrently when the effect of the fire-induced circuit failure is not sealed-in or latched. This criterion applies to consideration of concurrent hot shorts in secondary circuits and to their effect on a components primary control circuit. It is not to be applied to concurrent single hot shorts in primary control circuit for separate components in an MSO combination.
• For components classified as "important to safe shutdown", the duration of a hot short may be limited to 20 minutes. (If the effect of the spurious actuation involves a "sealing in" or "latching" mechanism, that is addressed separately from the duration of the spurious actuation, as discussed above.)
• For any impacted circuits for "important to safe shutdown" components that are located within the same fire area, protection in accordance with the requirements of Appendix R Section III.G.2 or plant specific license conditions may be used. In addition, consideration may be given to the use of fire modeling or operator manual actions, as an alternative to the requirements of Appendix R Section III.G.2. (Other resolution options may also be acceptable, if accepted by the Authority Having Jurisdiction.)

Alignment Basis:

FHAR Section 4.0 contains the results of the fire area evaluations and describes the assumptions, requirements, and methodology used to demonstrate compliance with Appendix R, Section III.G.

The "Detailed Analysis For Safe Shutdown" identifies all cables located in the fire area that may adversely affect safe shutdown equipment as a result of opens, shorts, or hot shorts. Where necessary to demonstrate availability of credited safe shutdown functions, circuit analysis was performed as part of the fire area compliance assessment which considers the potential impact of hot shorts, open circuits, and shorts-to-ground on unprotected cables. The results of any circuit analysis are documented in the "Notes" for that fire area.

Section 4.6 Fire Area Evaluations

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance, and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the fire area designation):

Section 4.6._.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited Train, as well as the disposition of each, are identified. It provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

5.0 ASSOCIATED CIRCUITS

5.3 Summary of Multiple High Impedance Fault Analysis

An analysis to evaluate the impact of multiple high impedance faults on the required 4160V AC, 480V AC, 250V DC, 125V DC, and 120/240V AC distribution systems was performed. The results of this analysis demonstrate that multiple high impedance faults will not impact the safe shutdown of the plant.

NRC Generic Letter 86-10 includes the consideration of simultaneous high impedance faults (item 5.3.8) on associated circuits. A high impedance fault current is assumed to result in a total current that is higher than normal but below the trip point of the circuit breaker or fuse. A fire is assumed to cause multiple high impedance faults on associated circuits. The purpose of the analysis is to show that the incoming breaker or fuse does not trip and cause a loss of the accredited common power source.

Existing circuit analyses have relied upon ungrounded DC circuit of the proper polarity not faulting in some cases. The analysis does not credit time limits of hot shorts (e.g. a hot short duration of up to 20 minutes) on components important to safe shutdown.

New circuits evaluated for the fire PRA during transition to NFPA 805 are evaluated in accordance with the Post Fire Safe Shutdown Cable Identification, which is Attachment 3 to calculation C-FP-013.10-018.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- C-EE-006.01-003, Rev. 5, "Multiple High Impedance Faults Caused by 10CFR50 Appendix R Fire"
- C-EE-017.01-003, Rev. 4, Add. 1, "Multiple High Impedance Faults Caused by 10CFR50 Appendix R Fire"
- C-FP-013.10-018, Rev. 0, "NFPA 805 Safe Shutdown, Non Power Operation, and FPRA Cable Selection Calculation"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

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NEI 00-01 Section:

3.5.1.2 - Spurious Operation Criteria

Alignment Statement: Not in Alignment, but No Adverse Consequences

Spurious Operation Criteria: The following criteria address the effect of multiple spurious operations of components classified as either "required for hot shutdown" or "important to safe shutdown" on post-fire safe shutdown. These criteria are to be applied to the population of components whose spurious operation has been determined to be possible based on an application of the circuit failure criteria described above when assessing impacts to post fire safe shutdown capability in any fire area.

• The set of concurrent combinations of spurious operations provided through the MSO Process outlined in Section 4 and the list of MSO contained in Appendix G must be included in the analysis of MSOs.

• MSOs do not need to be combined, except as explained in Section 4.4.3.4 of this document.

• Section 4.4.3.4 states that the expert panel should review the plant specific list of MSOs to determine whether any of the individual MSOs should be combined due to the combined MSO resulting in a condition significantly worse than either MSO individually.

• In this review, consideration of key aspects of the MSOs should be factored in, such as the overall number of spurious operations in the combined MSOs, the circuit attributes in Appendix B, and other physical attributes of the scenarios.

  • Specifically, if the combined MSOs involve more than a total of four components or if the MSO scenario requires consideration of sequentially selected cable faults of a prescribed type, at a prescribed time, in a prescribed sequence in order for the postulated MSO combination to occur, then this is considered to be beyond the required design basis for MSOs.

Alignment Basis:

This FHAR methodology is not consistent with the guidance provided in NEI 00-01. However, emergent industry issues related to multiple spurious operations (MSOs) are being addressed during the transition to NFPA 805. The issues were reviewed and analyzed per the guidance provided in NEI 00-01 and NEI 04-02. The results of the analysis are in the NFPA 805 Transition Report, Attachment F, Fire-Induced Multiple Spurious Operations Resolution.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- ARS-DB-0005, Rev. 0, "Multiple Spurious Operation (MSO) Expert Panel Review Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.5.1.3 - Circuit Contact Position

Alignment Statement: Aligns

Assume that circuit contacts are initially positioned (i.e., open or closed) consistent with the normal mode/position of the "required for hot shutdown" or "important to safe shutdown" equipment as shown on the schematic drawings. The analyst must consider the position of the "required for hot shutdown" and "important to 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 "required for hot shutdown" and "important to safe shutdown equipment".

Alignment Basis:

FHAR Section 3.4 identifiy the requirements and assumptions used for the review and evaluation of Safe Shutdown capability

Section 3.4.2 Assumptions

3. For the purpose of developing the safe shutdown components list (SSCL), it was conservatively assumed that the fire-induced failure of circuits for all safe shutdown components (including spurious components) causes the component to assume the most detrimental position for proper operation of the safe shutdown system. However, in the fire area evaluations (Section 4.6), the failure mode of safe shutdown components due to fire damage to its circuits was evaluated.

FHAR Section 4.0, Appendix R, Section III.G Evaluation, describes the Fire Area Assessment process and contains the requirements, assumptions, methodology, and results of the evaluation.

The Normal Mode, Shutdown Mode, and Fail mode of a component and the related circuits(s) subcomponents of concern are listed for evaluation in Table 1 of the Section 4.6_6 of each fire area evaluation. Component information also is provided that identifies if it is required for hot standby, cold shutdown, high/low interface, maintains boundary isolation, or is not affected

Section 4.6_6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited Train, as well as the disposition of each, are identified. It provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

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Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

NEI 00-01 Section:

3.5.2 - Types of Circuit Failures

Alignment Statement: Aligns

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 required for hot shutdown and important to safe 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 necessary to achieve and maintain 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 hot shutdown be free of fire damage and that these circuits be designed for the fire-induced effects of a hot short, short-to-ground, or an open circuit. With respect to the electrical distribution system, the issue of breaker coordination must also be addressed. Criteria for making the determination as to which breakers are to be classified as required for hot shutdown is contained in Appendix H.

This section will discuss specific examples of each of the following types of circuit failures:
• Open circuit
• Short-to-ground
• Hot short

Also, refer to Appendix B for the circuit failure criteria to be applied in assessing the impact of the Plant Specific List of MSOs on post-fire safe shutdown.

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.5.2.1 - Circuit Failures Due to an Open Circuit

Alignment Statement: Aligns with Intent

This section provides guidance for addressing the effects of an open circuit for required for hot shutdown and important to 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.

• Loss of electrical continuity may occur within a conductor resulting in deenergizing the circuit and causing a loss of power to, or control of, the required for hot shutdown and important to 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, possibly resulting in the occurrence of an additional fire in the location of the CT itself.

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.

Alignment Basis:

FHAR Section 4.0, Appendix R, Section III.G Evaluation, contains the results of the Fire Area Evaluation, which contains the requirements, assumptions, and methodology used for the evaluation.

The "Detailed Analysis For Safe Shutdown" identifies all cables located in the fire area that may adversely affect safe shutdown equipment as a result of opens, shorts, or hot shorts. Where necessary to demonstrate availability of credited safe shutdown functions, circuit analysis was performed as part of the fire area compliance assessment, which considers the potential impact of hot shorts, open circuits, and shorts-to-ground on unprotected cables. The results of any circuit analysis are documented in the "Notes" for that fire area.

Section 4.6 Fire Area Evaluations

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance, and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the Fire Area designation):

Section 4.6_.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited Train, as well as the disposition of each, are identified. It provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

Example for Fire Area FF Table Notes -related to current transformer circuits.

Note 44. Essential power supplies C1 and E1 are required to be operable for safe shutdown. Switches are installed to allow isolation from CSR and Control Room. The ammeter circuit for E1 is from a current transformer. A short or open on this circuit will not affect E1 (loss of indication only. Disconnect Control Room circuits by locally operating disconnect switch at C1 and E1.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

An evaluation of the potential for secondary fire effects due to open circuits on current transformers has been performed, based on RAIs HNP 3-17, ONS 3-48, and NUREG/CR-7150, Volume 1, "Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE-FIRE) - Phenomena Identification and Ranking Table (PIRT) Exercise for Nuclear Power Plant Fire-Induced Electrical Circuit Failure." Necessary modifications to eliminate credible potential for secondary fires will be planned based upon additional testing results, which may reduce the number of modifications required.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- ARS-DB-11-001, Rev. 4, "Analysis of Current Transformers as Potential Secondary Fire Sources"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- NUREG/CR-7150, Rev. Oct 2012, "Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE-FIRE)"

Open Items and VFDRs

Item Number DB-0582 **Item Title:** See Attachment S: Assessment of Current Transformer Fire Effects Due to Open Circuit

NEI 00-01 Section:

3.5.2.2 - Circuit Failures Due to a Short-to-Ground

Alignment Statement: Aligns

This section provides guidance for addressing the effects of a short-to-ground on circuits for required for hot shutdown and important to 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.

There is no limit to the number of shorts-to-ground that could be caused by the fire.

Consider the following consequences in the post-fire safe shutdown analysis when determining the effects of circuit failures related to shorts-to-ground:
• 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.
• 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.

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.

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 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.

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.

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. If multiple grounds can occur in a single fire area, they should be assumed to occur simultaneously unless justification to the contrary is provided.

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. If multiple grounds can occur in a single fire area, they should be assumed to occur simultaneously unless justification to the contrary is provided. Note that a simultaneous short-to-ground at locations No. 1 and No. 2 could result in a spurious close/stop. This condition is identical to that portrayed in Figure 3.5.2-5 should a hot short occur on the ungrounded circuit shown in Figure 3.5.2-5 at location No. 1.

Alignment Basis:

FHAR Section 4.0, Appendix R, Section III.G Evaluation, contains the results of the Fire Area Evaluation, which contains the requirements, assumptions, and methodology used for the evaluation.

The "Detailed Analysis For Safe Shutdown" identifies all cables located in the fire area that may adversely affect safe shutdown equipment as a result of opens, shorts, or hot shorts. Where necessary to demonstrate availability of a credited safe shutdown function, circuit analysis was performed as part of the fire area compliance assessment which considers the potential impact of hot shorts, open circuits, and shorts-to-ground on unprotected cables. The results of any circuit analysis are documented in the "Notes" for that fire area.

Section 4.6 Fire Area Evaluations

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance, and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the fire area designation):

Section 4.6._.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited Train, as well as the disposition of each, are identified. It provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

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The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.5.2.3 - Circuit Failures Due to a Hot Short

Alignment Statement: Aligns with Intent

This section provides guidance for analyzing the effects of a hot short on circuits for required for required for hot shutdown and important to 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:
• A hot short between an energized conductor and a de-energized conductor within the same cable may cause a spurious operation of equipment. The spuriously operated device (e.g., relay) may be interlocked with another circuit that causes the spurious operation of other equipment. This type of hot short is called an intra-cable hot short (also known as conductor-to-conductor hot short or an internal hot short).
• A hot short between any external energized source such as an energized conductor from another cable and a de-energized conductor may also cause a spurious operation of equipment. This is called an inter-cable hot short (also known as cable-to-cable hot short/external hot short).
• A hot short in the control circuitry for an MOV can bypass the MOV protective devices, i.e. torque and limit switches. This is the condition described in NRC Information Notice 92-18. In this condition, MOV motor damage can occur. Damage to the MOV motor could result in an inability to operate the MOV either remotely, using separate controls with separate control power, or manually using the MOV hand wheel. This condition could be a concern in two instances: (1) For fires requiring Control Room evacuation and remote operation from the Remote Shutdown Panel; (2) For fires where the selected means of addressing the effects of fire induced damage is the use of an operator manual action. In this latter case, analysis must be performed to demonstrate that the MOV thrust at motor failure does not exceed the capacity of the MOV hand wheel. For either case, analysis must demonstrate the MOV thrust at motor failure does not damage the MOV pressure boundary.

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 the impact of these individual cable faults on the operation of the equipment controlled by this circuit.

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.

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 the impact of these cable faults on the operation of the equipment controlled by this circuit.

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.

<u>Alignment Basis:</u>

FHAR Section 4.0, Appendix R, Section III.G Evaluation, contains the results of the fire area evaluation and describes the requirements, assumptions, and methodology used for the evaluation.

The "Detailed Analysis For Safe Shutdown" identifies all cables located in the fire area that may adversely affect safe shutdown equipment as a result of opens, shorts, or hot shorts. Where necessary to demonstrate availability of a credited safe shutdown function, circuit analysis was performed as part of the fire area compliance assessment, which considers the potential impact of hot shorts, open circuits, and shorts-to-ground on unprotected cables. The results of any circuit analysis is documented in the "Notes" for that fire area.

Section 4.6 Fire Area Evaluations

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance, and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the fire area designation):

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Section 4.6_.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited Train, as well as the disposition of each, are identified. The table provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.5.2.4 - Circuit Failures Due to Inadequate Circuit Coordination

Alignment Statement: Aligns with Intent

The evaluation of 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 hot 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 circuits' common power source breaker coordination issue, load breaker 4 must be fully coordinated with the feeder breaker to the Train A bus.

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/o 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 circuits of a common power source and evaluating circuit coordination cases on a single circuit fault basis is as follows:
• Identify the power sources required to supply power to safe shutdown equipment.
• 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.
• For each power source, demonstrate proper circuit coordination using acceptable industry methods. For example, for breakers that have internal breaker tripping devices and do not require control power to trip the breaker, assure that the time-current characteristic curve for any affected load breaker is to the left of the time-current characteristic curve for the bus feeder breaker and that the available short circuit current for each affected breaker is to the right of the time-current characteristic curve for the bus feeder breaker or that the bus feeder breaker has a longer time delay in the breaker instantaneous range than the load breaker. For breakers requiring control power for the breaker to trip, the availability of the required control power must be demonstrated in addition to the proper alignment of the time-current characteristic curves described above. The requirement for the availability of control power would apply to load breakers fed from each safe shutdown bus where a fire-induced circuit failure brings into questions the availability of coordination for a required for hot shutdown component.
• 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 circuit of concern are routed and the power source is required for hot shutdown. Prepare a list of the following information for each fire area:
  - Cables of concern.
  - Affected common power source and its path.
  - Raceway in which the cable is enclosed.
  - Sequence of the raceway in the cable route.
  - 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 circuit of concern cables routed in an area of the same path as required by the power source. Evaluate adequate separation and other mitigation measures based upon the criteria in Appendix R, NRC staff guidance, and plant licensing bases.

Alignment Basis:

FHAR Section 5.0 describes the evaluation of "Associated" circuits whose fire-induced failure could prevent operation or cause maloperation of Shutdown systems and equipment. The identification of these associated circuits of concern was performed in accordance with NRC Generic Letter 81-12 and the staff's clarification to the Generic Letter.

The evaluation of possible spurious operation of equipment was included in the circuit analysis performed for safe shutdown equipment, as documented in Section 4.

Section 5.1 Common Power Source Analysis

Section 5.1.1 Introduction

The electrical distribution system was reviewed to ensure that acceptable coordination and selective tripping is provided for all circuits in the Essential Power System. The review was limited to circuits supplied from power sources which feed loads required for safe shutdown.

The power sources reviewed are as follows:

O	4160V AC	Switchgears C1, C2, D1, and D2
O	480V AC	Essential Unit Substations E1 and F1
O	480V AC	Unit Substation F7
O	480V AC	Essential Motor Control Centers
O	250/125V DC	Essential Motor Control Centers DC MCC 1 and DC MCC 2
O	240/120V AC	Essential MCC YE1, YE2, YF1, YF2
O	125V DC	Essential Distribution Panels D1P, D1N, D2P, and D2N
O	125V DC	Distribution Panels DAP, DAN, DBP, and DBN
O	120V AC	Essential Instrumentation Distribution Panels Y1, Y2, Y3 and Y4
O	120V AC	Uninterruptable Instrumentation Distribution Panels YAU and YBU
O	Cabinets	Cabinets & Panel used as power supply panels

Section 5.1.2 Methodology

The safe shutdown components in Appendix A are evaluated to determine if power to the component is required for safe shutdown. If power is required, then associated circuits which share this common power source are evaluated. The method of evaluation depends on the power source.

Electrical coordination at the 4kV level is provided as supported by the relay setting sheets. Safe shutdown cables include power, breaker control, and protective relaying circuits. Procedures require the stripping of all associated circuits on Buses C2 and D2 prior to using the backup service water pumps and the motor-driven feed pump.

Each 480V MCC-associated power cable associated with a Safe Shutdown MCC is identified on electrical one-line drawings, routed in Appendix C-1 and C-2, and evaluated as an associated circuit (ASSCKT) in each fire area.

The associated circuit is evaluated for the next level of coordination based on the largest internal fuse. This is required when safe shutdown and non-safe shutdown loads are fed from a single fuse. For example, a typical circuit feeds three panels off a 10-amp fuse. Only one is considered safe shutdown, but all three cables are associated with the safe shutdown component and routed in FHAR Appendix B. The largest fuse on the other two non-safe shutdown relay cabinets is evaluated to ensure that a short there blows the fuse at the non-safe shutdown panel instead of the 10-amp fuse.

Credit is taken for a power source only when adequate coordination can be shown. The most conservative characteristic curve for a fuse is assumed based on the various types stocked in the warehouse. When the incoming and load protective device coordinate, a "YES" is entered in Appendix C-3.

For breaker coordination, Appendix C-3 Note 8:

GENERAL NOTE: Due to implementation of FCR 85-0063, the 480V level has been adequately coordinated for safe shutdown; see the "480V Breaker Coordination to Meet Common Power Source Criteria of Appendix R" (Calculation C-EE-013.10-00 1). Cables associated with breakers that will have the automatic trip function removed are listed in Appendix C-3 and are protected by the upstream breakers.

While the FHAR methodology is consistent with the guidance provided in NEI 00-01, and Davis-Besse aligns with the intent of the guidance, during the transition to NFPA 805, power supplies for additional equipment credited in the fire PRA for risk reduction have been analyzed in calculation C-FP-013.10-018.

That analysis includes consideration of common enclosure effects on circuit failures, in accordance with assumption 3.9, "All NFPA 805/Fire PRA cable selection and cable location have been performed consistent with the methodology described in NEI 00-01."

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- C-EE-013.10-001, Rev. 1, "480V Breaker Coordination to Meet Common Power Source Criteria for Appendix R"
- C-FP-013.10-018, Rev. 0, "NFPA 805 Safe Shutdown, Non Power Operation, and FPRA Cable Selection Calculation"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.5.2.5 - Circuit Failures Due to Common Enclosure Concerns

Alignment Statement: Aligns

The common enclosure 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.

Alignment Basis:

FHAR Section 5.0 describes the evaluation of “Associated” circuits whose fire-induced failure could prevent operation or cause maloperation of shutdown systems and equipment. The identification of these associated circuits of concern was performed in accordance with NRC Generic Letter 81-12 and the staff's clarification to the Generic Letter.

The evaluation of possible spurious operation of equipment was included in the circuit analysis performed for safe shutdown equipment as documented in Section 4.

Section 5.2, Common Enclosure Analysis, describes the objective, assumptions, methodology, and the results of the analysis based on the regulatory guidance provided in the "Clarification to NRC Generic Letter 81-12," Enclosure 2.

Section 5.2.3 Methodology

The methodology utilized to perform the common enclosure study is outlined below

1. The safe shutdown “Circuit/Subcomponent Location Summary by System” (Appendix B-1) was used to identify common enclosures (i.e., cable trays, conduits, junction boxes, terminal boxes, relay cabinets, local panels, and electrical penetrations) which contain both safe shutdown circuits and non-safe shutdown circuits.

2. Non-safe shutdown circuits contained within the above common enclosures were identified from the Electrical Raceway Schedule and the Equipment Circuit Schedule.

3. A sample population of circuits was chosen to include all representative types of electrical circuits that power control and instrumentation. Verification was made that an interrupting device (i.e., breaker, fuse or similar device) is shown on the electrical drawings for the circuits within common enclosures in this sample population.

4. Documentation was obtained which indicated that appropriate measures have been provided at DB-1 to prevent propagation of fire, which may damage safe shutdown circuits for common enclosure cases of associated circuits. The specific requirements are outlined in Criterion B.2.c. of the "Clarification of NRC Generic Letter 81-12," Enclosure 2.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

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

Physical location of equipment and cables shall be identified.

NEI 00-01 Section:

3.3.3.4 - Identify Routing of Cables

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control, and instrumentation required to ensure proper operations of safe shutdown systems and components.

3.8.2 Methodology

The following is a discussion of the steps that were performed to identify the safe shutdown circuits and their routings throughout the plant.

2. The physical cable routings for power, control, and instrumentation circuits were identified by reviewing the Electrical Circuit Schedules and Electrical Raceway Schedules. Also included in the identification process were subcomponents, such as junction boxes, terminal boxes, local control panels, relay cabinets, switches and transmitters.

The FHAR methodology is consistent with NEI 00-01 guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.3.3.5 - Identify Location of Raceway and Cables by Fire Area

Alignment Statement: Aligns

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. For raceway and cable endpoints in multiple fire areas, each fire area where the raceway or cable endpoint exists must be included. 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.

Alignment Basis:

FHAR Section 3.8 provides a description of the methodology used to identify electrical circuits related to power, control, and instrumentation required to ensure proper operations of safe shutdown systems and components.

3.8.2 Methodology

The following is a discussion of the steps that were performed to identify the safe shutdown circuits and their routings throughout the plant.

3. The cable routing information, identified from Step 2, was then utilized to trace their cables on the electrical raceway and grounding drawings. Consequently, those fire areas in which safe shutdown circuits traverse were so identified per circuit.

The FHAR methodology is consistent with guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NFPA 805 Section: 2.4.2.4 - 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 Section:

3.4 - Fire Area Assessment and Compliance Strategies

Alignment Statement: Aligns

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. Knowing which components and systems are performing which safe shutdown functions, the required and important to SSD components can be classified. Once these component classifications have been made the tools available for mitigating the affects of fire induced damage can be selected. Refer to Appendix H for additional guidance on classifying components as either required for hot shutdown or important to safe shutdown. For MSOs the Resolution Methodology outlined in Section 4, Section 5, Appendix B and Appendix G should be applied. Components in each MSO are classified as either required for hot shutdown or important to safe shutdown components using the criteria from Appendix H. Similarly, this classification determines the available tools for mitigating the affects of fire-induced damage to the circuits for these components.

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.

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with guidance provided in NEI 00-01.

Using the criteria from Appendix H of NEI 00-01, Rev. 2 to classify each impacted cable/component as either a "Required" or "Important to SSD" cable/component is part of the methodology used to determine if an operator manual action is permitted or if another resolution is required to resolve MSOs and comply with the requirement of Appendix R 10CFR50. The classifications were not industry standards or regulatory requirements at the time the component identification and cable selection was performed for the Davis-Besse fire area evaluations. Therefore, cables and components were not classified as "Required for safe shutdown" or "Important for safe shutdown." This does not impact the FHAR selection of systems, equipment, cables, and the identification of their location for use in the transitioning nuclear safety analysis. The FHAR identifies a "justification" when the protection of cables and/or components in a fire area of systems whose function is required for Hot Shutdown does not meet Appendix R requirements.

FHAR methodology is consistent with the guidance provided in NEI 00-01, Rev. 2.

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- None

NEI 00-01 Section:

3.4.1 - Criteria/Assumptions

Alignment Statement: Aligns

The following criteria and assumptions apply when performing "deterministic" 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.

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.1.1 - Assume Single Fire

Alignment Statement: Aligns

Assume only one fire in any single fire area at a time.

Alignment Basis:

FHAR Section 4.0 contains the results of the fire area evaluations and describes the assumptions, requirements, and methodology used to demonstrate compliance with Appendix R, Section III.G.

Section 4.3 Assumptions

7. Only one fire and its effects are postulated to occur at a time, and the fire will not propagate past the rated barriers. However, credit is taken for horizontal separation within a fire area based on the combustible loading, the spatial separation, the type of suppression, and physical barriers.

The FHAR methodology is consistent with guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.1.2 - Fire Affects All Unprotected Cables and Equipment

Alignment Statement: Aligns

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 postulated in the regulation.

Alignment Basis:

FHAR Section 4.0 contains the results of the fire area evaluations and describes the assumptions, requirements, and methodology used to demonstrate compliance with Appendix R, Section III.G.

Section 4.1 Introduction

The purpose of this section is to evaluate the fire protection features that assure safe shutdown capability as required by Section III. G of Appendix R to 10 CFR 50. The components and circuits required for safe shutdown were identified by the methodology described in Section 3.

Section 3 provides a discussion of the identification and routing information for Associated Circuits. The circuit routing information for safe shutdown circuits and associated circuits was sorted by fire area (refer to Appendices B-2 and C-2, respectively). This made possible the evaluation of safe shutdown system components and circuits, as well as associated circuits, to the requirements of Section III.G criteria.

The following aspects of the existing plant configuration were considered during the evaluations of each of the fire area’s compliance with Section III.G:

1) The barriers rated from 1 to 3 hours
2) The fire suppression systems
3) The fire detection systems
4) The combustible loading
5) The safe shutdown systems

This information is provided for each fire area in Section 4.6 when credit is taken for barriers in addition to those defining the fire area. Specific items not in compliance with Section III.G, as well as their resolutions, are identified.

Section 4.6 Fire Area Evaluation

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance, and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the fire area designation):

Section 4.6._.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited train, as well as the disposition of each, are identified. It provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

The FHAR methodology is consistent with guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.1.3 - Address All Cables and Equipment Impacts Affecting the Required Safe Shutdown Path **Alignment Statement:** Aligns

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.

Alignment Basis:

FHAR Section 4.0 contains the results of the fire area evaluations and describes the assumptions, requirements, and methodology used to demonstrate compliance with Appendix R, Section III.G.

4.6._.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited train, as well as the disposition of each, are identified. The table provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

Certain safe shutdown components serve as either Train 1 or Train 2 components depending on which train the component is supporting. For example, CCW Pump 3 is a "swing" pump in that it may either service Train 1 or Train 2 of the CCW.

All such components are designated as "1/2" components. These "swing" components have Channels 1, 2, and 3 circuits. If Train 1 were being assured for shutdown, and circuits for such a component passed through the fire area under consideration, only the Channel 1 and 3 circuits would appear on Table 1. Channel 2 circuits would not appear, since no credit is taken for these circuits. In a Train 2 area, the reverse will apply.

Certain safe shutdown components are identified as "boundary valves" and/or high/low interfaces, which means that the valve is required to remain closed to preclude flow diversion. Such components need to be evaluated for all fire areas where circuits for the component are located, regardless of the train being assured for shutdown. As an example, the pilot-operated relief valve (PORV), despite having Train 2 circuits, must be addressed for all fire areas so that the possible spurious actuation of the valve does not result in a loss of RCS pressure or inventory control.

Certain safe shutdown components for the non-accredited train are included because their potential automatic actuation from spurious or actual signals (e.g., SFAS or SFRCS) may require compensatory operator action. For these components, any circuits located in the fire area are included regardless of their train.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Pre-transition operator actions will be transitioned as recovery actions consistent with approved guidance set forth in NEI 04-02 and applicable FAQs.

Table B-2 Nuclear Safety Capability Assessment
Methodology Review
Transition Report

Davis-Besse

Licensing Actions

- None

Open Items and VFDRs

-None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Table B-2 Nuclear Safety Capability Assessment
Methodology Review
Transition Report

Davis-Besse

NEI 00-01 Section:

3.4.1.4 - Classify Each Cable/Component

Alignment Statement: Aligns with Intent

Use the criteria from Appendix H to classify each impacted cable/component as either a required or important to SSD cable/component.

Alignment Basis:

Appendix H recommendations in NEI 00-01, Rev. 2 to classify each impacted cable/component as either a "Required" or "Important to SSD cable/component" were not industry standards or regulatory requirements at the time the component identification and cable selection was performed for the Davis-Besse fire area evaluations. Therefore, cables and components were not classified as "Required for safe shutdown" or "Important for safe shutdown." This does not impact the FHAR selection of systems, equipment, cables and the identification of their location for use in the transitioning nuclear safety analysis. The FHAR identifies a "justification" when the protection of cables and/or components in a fire area of systems whose function is required for Hot Shutdown does not meet Appendix R requirements.

FHAR methodology, while not identical to, is consistent with the guidance provided in NEI 00-01, Rev. 2.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.1.5 - Manual Actions

Alignment Statement: Not in Alignment, but No Adverse Consequences

Use operator manual actions where appropriate, for cable/component impacts classified as important to SSD cable/components, to achieve and maintain post-fire safe shutdown conditions in accordance with NRC requirements (refer to Appendix E). For additional criteria to be used when determining whether an operator manual action may be used for a flow diversion off of the primary flow path, refer to Appendix H.

Alignment Basis:

The Fire Hazard Analysis Report, Section 4.6, Fire Area Evaluation, identifies the components that may require manual actions due to the effects of fire in the \'Note\' sections of the affected fire area\'s evaluation. Manual actions are performed as prescribed in procedures based results of the Davis-Besse fire area evaluations.

Emergent industry issues related to operator manual actions (OMAs) and multiple spurious operations (MSOs) are being addressed during the transition to NFPA 805. The issues were reviewed and analyzed per the guidance provided in NEI 00-01 and NEI 04-02. This does not impact the FHAR selection of systems, equipment, cables, and the identification of their location for use in the transitioning nuclear safety analysis.

Using the criteria from Appendix H of NEI 00-01, Rev. 2 to classify each impacted cable/component as either a \'Required\' or \'Important to SSD cable/component\' is part of the methodology used to determine if an operator manual action is permitted or if another resolution is required to resolve MSOs and comply with the requirement of Appendix R 10CFR50. The classifications were not industry standards or regulatory requirements at the time the component identification and cable selection were performed for the Davis-Besse fire area evaluations. Therefore, cables and components were not classified as \'Required for safe shutdown\' or \'Important for safe shutdown\'. This does not impact the FHAR selection of systems, equipment, cables, and the identification of their location for use in the transitioning nuclear safety analysis. The FHAR identifies a \'justification\' when the protection of cables and/or components in a fire area of systems whose function is required for Hot Shutdown does not meet Appendix R requirements.

The FHAR methodology is not consistent with this guidance provided in NEI 00-01.

Pre-transition operator actions will be transitioned as recovery actions consistent with approved guidance set forth in NEI 04-02 and applicable FAQs.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-2 Nuclear Safety Capability Assessment
Methodology Review
Transition Report

Davis-Besse

NEI 00-01 Section:

3.4.1.6 - Repair Actions

Alignment Statement: Aligns

Where appropriate to achieve and maintain cold shutdown within 72 hours, use repairs to equipment required in support of post-fire shutdown.

Alignment Basis:

The Fire Hazard Analysis Report Section 4.6, Fire Area Evaluation, identifies the components that may require repair due to the effects of fire in the "Note" sections of the affected fire area's evaluation. Repair actions are performed as prescribed in procedures based on the results of the Davis-Besse fire area evaluations.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

This review acknowledges that the NFPA 805 requirement to achieve a "safe and stable state" is not the same as the ability "to achieve and maintain cold shutdown within 72 hours" as required in Appendix R.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.1.7 - Appendix R Separation Criteria

Alignment Statement: Aligns with Intent

For the components on the required safe shutdown path classified as required hot shutdown components as defined in Appendix H, 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 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 components impacted circuit(s):
• Separation of cables and equipment and associated non-safety circuits of redundant trains within the same fire area by a fire barrier having a 3-hour rating (III.G.2.a)
• Separation of cables and equipment and associated non-safety 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).
• 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 non-inerted containments, the following additional options are also available:
• Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards (III.G.2.d);
• Installation of fire detectors and an automatic fire suppression system in the fire area (III.G.2.e); or
• 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, LARs and licensing change processes to satisfy the requirements mentioned above and to demonstrate equivalency depending upon the plant's license requirements.

Alignment Basis:

FHAR Section 4.0 contains the results of the fire area evaluations and describes the assumptions, requirements, and methodology used to demonstrate compliance with Appendix R, Section III.G.

Section 4.1 Introduction

The purpose of this section is to evaluate the fire protection features that assure safe shutdown capability as required by Section III. G of Appendix R to 10 CFR 50. The components and circuits required for safe shutdown were identified by the methodology described in Section 3.

The following aspects of the existing plant configuration were considered during the evaluations of each of the fire area's compliance with Section III.G:

1) The barriers rated from 1 to 3 hours
2) The fire suppression systems
3) The fire detection systems
4) The combustible loading and
5) The safe shutdown systems

This information is provided for each fire area in Section 4.6 when credit is taken for barriers in addition to those defining the fire area. Specific items not in compliance with Section III.G, as well as their resolutions, are identified.

Section 4.2 Requirements

The requirements for fire protection of safe shutdown capability are defined in Appendix R, Section III.G. This regulation requires that fire protection be provided to ensure that one train of equipment necessary to achieve and maintain safe shutdown remains available in the event of a fire in any location within the plant. For hot standby conditions, one train of the necessary systems must be free of fire damage (IIIG.1.a). For cold shutdown conditions, both trains of equipment necessary to achieve and maintain cold shutdown conditions may be damaged by a single fire, including an exposure fire, but damage must be limited so that at least one train can be repaired within 72 hours using "in place" procedures and materials available on site (III.G.1.b).

While the FHAR methodology is consistent with the guidance provided in NEI 00-01, in light of the NFPA 805 requirement to achieve "safe and stable state" versus the ability "to achieve and maintain cold shutdown within 72 hours" in Appendix R, Davis-Besse aligns with the intent of the guidance.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.1.8 - Alternate/Backup Equipment Selection

Alignment Statement: Aligns

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 operation, is to be addressed in accordance with regulatory requirements and the NPP's current licensing basis. With respect to MSOs, the criteria in Section 4, Appendix B, Appendix G and Appendix H should be used.

Alignment Basis:

FHAR Section 4.0 contains the results of the fire area evaluations and describes the assumptions, requirements, and methodology used to demonstrate compliance with Appendix R, Section III.G.

4.6_.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited train, as well as the disposition of each, are identified. The table provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

4.6._.6 TABLE 1 Detailed Analysis Column 10 identifies the backup or alternate components for use.

10. Backup for- Specifies if the component under consideration is a backup for another component, which would be identified in this column.

The FHAR methodology is consistent with this guidance provided in NEI 00-01.

Additional systems, equipment and cables have been added to the transitioning nuclear safety analysis SAFE database and model for NFPA 805 Transition & Fire PRA as appropriate.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-2 Nuclear Safety Capability Assessment
Methodology Review
Transition Report

Davis-Besse

NEI 00-01 Section:

3.4.1.9 - Fluid Density Effects

Alignment Statement: Aligns

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.

Alignment Basis:

The effects of the fire on the density of the fluid in instrument tubing and any subsequent effects on instrument readings is not addressed in the FHAR. For applicable credited instrumentation, the identification of associated instrument tubing for evaluation was not described as a criterion or part of the methodology for safe shutdown component identification at Davis-Besse.

A separate evaluation was subsequently performed during the transition to NFPA 805. That evaluation, ARS-DB-11-016, reviewed process instrumentation components and tubing and documented the analysis of the post-fire damage status for the equipment of interest.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- ARS-DB-11-016, Rev. 2, "Instrument Tubing Analysis"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

Table B-2 Nuclear Safety Capability Assessment
Methodology Review
Transition Report

Davis-Besse

NEI 00-01 Section:

3.4.2 - Methodology for Fire Area Assessment

Alignment Statement: Aligns

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:

Alignment Basis:

This is an introductory paragraph and does not contain any specific guidance. The specific guidance, and references to the applicable Davis-Besse documents, is provided in the subsequent sections. Except as specifically noted below, the FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- None

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.2.1 - Identify the Affected Equipment by Fire Area

Alignment Statement: Aligns

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).

Alignment Basis:

FHAR Section 4.0, Appendix R, Section III.G Evaluation, describes the Fire Area Assessment process and contains the requirements, assumptions, methodology, and results of the evaluation.

Section 4.1 Introduction

The purpose of this section is to evaluate the fire protection features that assure safe shutdown capability as required by Section III. G of Appendix R to 10 CFR 50. The components and circuits required for safe shutdown were identified by the methodology described in Section 3.

Section 3 provides a discussion of the identification and routing information for associated circuits. The circuit routing information for safe shutdown circuits and associated circuits was sorted by fire area (refer to Appendices B-2 and C-2, respectively). This made possible the evaluation of safe shutdown system components and circuits, as well as Associated Circuits, to the requirements of Section III.G criteria.

The following aspects of the existing plant configuration were considered during the evaluations of each of the fire area's compliance with Section III.G:

1) The barriers rated from 1 to 3 hours
2) The fire suppression systems
3) The fire detection systems
4) The combustible loading and
5) The safe shutdown systems

This information is provided for each fire area in Section 4.6 when credit is taken for barriers in addition to those defining the fire area. Specific items not in compliance with Section III.G, as well as their resolutions, are identified.

Section 4.6 Fire Area Evaluations

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance, and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the fire area designation):

Section 4.6._.2 Safe Shutdown Systems in the Fire Area

This subsection provides an overview of the shutdown systems and components located in the fire area. The component train, type and description are also provided. (Note: Appendices B2 and C2 provide a listing of cables/circuits).

The purpose of this subsection is to provide at-a-glance information as to which safe shutdown systems and components could be impacted by a fire in this fire area.

Section 4.6._.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited train, as well as the disposition of each, are identified. The table provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

The FHAR methodology is consistent with guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.2.2 - Determine the Shutdown Paths Least Impacted By a Fire in Each Fire Area

Alignment Statement: Aligns

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. Determine which components are required hot shutdown components and which components are important to SSD components using the guidance in Appendix H.

Based on an assessment as described above, designate the required safe shutdown path(s) for the fire area. Classify the components on the required safe shutdown path necessary to perform the required safe shutdown functions as required safe shutdown components. Identify all equipment not in the safe shutdown path whose spurious operation or mal-operation could affect the shutdown function. Criteria for classifying these components as required for hot shutdown or as important to SSD is contained in Appendix H. Include the affected 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.

Alignment Basis:

FHAR Section 4.0, Appendix R, Section III.G Evaluation, describes the fire area assessment process and contains the requirements, assumptions, methodology, and results of the evaluation.

Section 4.1 Introduction

The purpose of this section is to evaluate the fire protection features that ensure safe shutdown capability as required by Section III.G of Appendix R to 10 CFR 50. The components and circuits required for safe shutdown were identified by the methodology described in Section 3.

Section 3 provides a discussion of the identification and routing information for associated circuits. The circuit routing information for safe shutdown circuits and associated circuits was sorted by fire area (refer to Appendices B-2 and C-2, respectively). This made possible the evaluation of safe shutdown system components and circuits, as well as associated circuits, to the requirements of Section III.G criteria.

The following aspects of the existing plant configuration were considered during the evaluations of each of the fire area's compliance with Section III.G:

1) The barriers rated from 1 to 3 hours
2) The fire suppression systems
3) The fire detection systems
4) The combustible loading and
5) The safe shutdown systems

This information is provided for each fire area in Section 4.6 when credit is taken for barriers in addition to those defining the fire area. Specific items not in compliance with Section III.G, as well as their resolutions are identified.

Section 4.6 Fire Area Evaluations

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance, and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the Fire Area designation):

Section 4.6._.5 Fire Area Safe Shutdown Summary

The summary specifies which train is being ensured for shutdown, and the availability of certain critical safe shutdown components required to be operable for providing RCS pressure and pressurizer level control and for maintaining Hot Standby are identified for a fire in the particular fire area.

Section 4.6_.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited train, as well as the disposition of each, are identified. The table provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

Certain safe shutdown components serve as either Train 1 or Train 2 components, depending on which train the component is supporting. For example, CCW Pump 3 is a "swing" pump in that it may either service Train 1 or Train 2 of the CCW.

All such components are designated as "1/2" components. These "swing" components have Channels 1, 2, and 3 circuits. If Train 1 were being assured for shutdown and circuits for such a component passed through the fire area under consideration, only the Channel 1 and 3 circuits would appear on Table 1. Channel 2 circuits would not appear, since no credit is taken for these circuits. In a Train 2 area the reverse will apply.

Certain safe shutdown components are identified as "boundary valves" and/or "High/Low Interfaces," which means that the valve is required to remain closed to preclude flow diversion. Such components need to be evaluated for all fire areas where circuits for the component are located, regardless of the train being assured for shutdown. As an example, the pilot-operated relief valve (PORV),despite having Train 2 circuits, must be addressed for all fire areas so that the possible spurious actuation of the valve does not result in a loss of RCS pressure or inventory control.

Certain safe shutdown components for the non-credited train are included because their potential automatic actuation from spurious or actual signals (e.g. SFAS or SFRCS) may require compensatory operator action. For these components, any circuits located in the fire area are included regardless of their train.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.2.3 - Determine Safe Shutdown Equipment Impacts

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 4.0, Appendix R, Section III.G Evaluation, contains results of the Fire Area Evaluations and contains the requirements, assumptions, and methodology used for the evaluation.

Section 4.6 Fire Area Evaluations

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the fire area designation):

Section 4.6._.5 Fire Area Safe Shutdown Summary

The summary specifies which train is being assured for shutdown. The availability of certain critical safe shutdown components required to be operable for providing RCS pressure and pressurizer level control and for maintaining Hot Standby are identified for a fire in the particular fire area.

Section 4.6_.6 Detailed Analysis For Safe Shutdown

This information is presented in tabular form (Table 1). All circuits and components for the accredited train, as well as the disposition of each, are identified. The table provides information concerning each circuit with regard to an abbreviated justification for compliance. The table also references the notes that explain the justification.

Certain safe shutdown components for the non-credited train are included because their potential automatic actuation from spurious or actual signals (e.g., SFAS or SFRCS) may require compensatory operator action. For these components, any circuits located in the fire area are included, regardless of their train.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

3.4.2.4 - Develop a Compliance Strategy or Disposition to Mitigate the Effects Due to Fire Damage to Each Required Component or Cable

Alignment Statement: Aligns with Intent

The available deterministic methods for mitigating the effects of circuit failures are summarized as follows (see Figure 1-1):

Required for Hot Shutdown Components:
• Re-design the circuit or component to eliminate the concern. This option will require a revision to the post-fire safe shutdown analysis.
• Re-route the cable of concern. This option will require a revision to the post-fire safe shutdown analysis.
• Protect the cable in accordance with III.G.2.
• Provide a qualified 3-fire rated barrier.
• Provide a 1-hour fire rated barrier with automatic suppression and detection.
• 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.Perform a cold shutdown repair in accordance with regulatory requirements.
• Identify other equipment not affected by the fire capable of performing the same safe shutdown function.
• Develop exemptions, deviations, LARs, Generic Letter 86-10 evaluation or fire protection design change evaluations with a licensing change process.

Important to Safe Shutdown Components:
• Any of the options provided for required for hot shutdown components.
• Perform and operator manual action in accordance with Appendix E.
• Address using fire modeling or a focused-scope fire PRA using the methods of Section 5 for MSO impacts. [Note: The use of fire modeling will require a review by the Expert Panel and the use of a focused-scope fire PRA will require a LAR.]

Additional options are available for non-inerted containments as described in 10 CFR 50 Appendix R section III.G.2.d, e and f.

Alignment Basis:

FHAR Section 4.0, Appendix R, Section III.G Evaluation, describes the Fire Area Assessment process and contains the requirements, assumptions, methodology, and results of the evaluation.

Section 4.1 Introduction

The purpose of this section is to evaluate the fire protection features that assure safe shutdown capability as required by Section III. G of Appendix R to 10 CFR 50. The components and circuits required for safe shutdown were identified by the methodology described in Section 3.

Section 3 provides a discussion of the identification and routing information for associated circuits. The circuit routing information for safe shutdown circuits and associated circuits was sorted by fire area (refer to Appendices B-2 and C-2, respectively). This made possible the evaluation of safe shutdown system components and circuits, as well as associated circuits, to the requirements of Section III.G criteria.

The following aspects of the existing plant configuration were considered during the evaluations of each of the fire area's compliance with Section III.G:

1) The barriers rated from 1 to 3 hours
2) The fire suppression systems
3) The fire detection systems
4) The combustible loading and
5) The safe shutdown systems

This information is provided for each fire area in Section 4.6 when credit is taken for barriers in addition to those defining the fire area. Specific items not in compliance with Section III.G, as well as their resolutions are identified.

Section 4.6 Fire Area Evaluations

The evaluation of each fire area is presented in this subsection. Each fire area evaluation includes the basis for the conclusions of compliance, and a summary of the approved exemption request(s). Each of the fire area evaluations included in this subsection were developed using a standard format as follows (note that the"-" refers to the Fire Area designation):

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Emergent industry issues related to operator manual actions (OMAs) and multiple spurious operations (MSOs) are being addressed during the transition to NFPA 805. The issues were reviewed and analyzed per the guidance provided in NEI 00-01 and NEI 04-02. This does not impact the FHAR selection of systems, equipment, cables, and the identification of their location for use in the transitioning nuclear safety analysis.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

NEI 00-01 Section:

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

Alignment Statement: Aligns

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.

Alignment Basis:

FHAR Section 4.0, Appendix R, Section III.G Evaluation, describes the fire area assessment process and contains the requirements, assumptions, methodology and results of the evaluation.

4.6._.5 Fire Area Safe Shutdown Summary

The summary specifies which train is being assured for shutdown. The availability of certain critical safe shutdown components required to be operable for providing RCS pressure and pressurizer level control and for maintaining hot standby are identified for a fire in the particular fire area.

The FHAR methodology is consistent with the guidance provided in NEI 00-01.

Licensing Actions

- None

Supporting Documents

- No Documents
- No Evaluations

References

- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Open Items and VFDRs

-None

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

387 Pages Attached

Transition Report Attachment

Davis-Besse

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

Transition Report Section: **- Attachments**

Transition Report Subsection: **C - NEI 04-02 Table B-3 - Fire Area Transition**

NEI 04-02 Table B-3 Fire Area Transition

The nuclear safety goal of NFPA 805 is to provide reasonable assurance that a fire during any operational mode and plant configuration will not prevent the plant from achieving and maintaining the fuel in a safe and stable condition. A safe and stable condition is defined as the ability to maintain Keff <0.99, with a reactor coolant temperature at or below the requirements for hot standby (Mode 3). The following table documents this for 'at-power' modes of operation.

To meet this nuclear safety goal, fire protection features shall be capable of providing reasonable assurance that, in the event of a fire, the plant is not placed in an unrecoverable condition. The licensee must demonstrate the ability to maintain one success path of required equipment effectively free of fire damage. This was accomplished at Davis-Besse by developing and analyzing a comprehensive list of systems and equipment to identify those critical components required to achieve and maintain the fuel in a safe and stable condition for 24 hours following a fire from at power conditions.

The fire compartment analyses consider control of the plant from the main control rooms or the Auxiliary Shutdown Panel (ASP) depending on the actual fire location. The strategy for achieving the nuclear safety performance criteria for each fire compartment is documented in Table B-3. The following strategies are used to achieve a safe and stable condition to accomplish the nuclear safety goal of NFPA 805.

Reactivity Control

The reactivity control function is capable of achieving and maintaining reactor shutdown from the initial reactor trip to safe and stable conditions, including compensation for any positive reactivity increases as a result of Xenon-135 decay and reactor coolant temperature decreases.

Safe shutdown of the reactor is achieved by a manual trip of the reactor from the control room. After a reactor trip, shutdown margin for a safe and stable condition is maintained by the Makeup and Purification System (MUPS) or High Pressure Injection System (HPIS) boron injection from the borated water storage tank (BWST). The makeup pumps (MUP) or the high pressure injection (HPI) pumps take suction from the BWST that contains borated water at a concentration and level within Technical Specifications requirements.

Inventory and Pressure Control

The inventory and pressure control function is capable of (1) ensuring that sufficient borated make-up inventory is provided from the BWST to compensate for primary coolant shrinkage and replacement of any coolant that may escape due to normal leakage from the system and (2) to prevent RCS overfill from challenging the primary safety valves.

Reactor coolant system (RCS) inventory is maintained by control of RCS makeup and letdown to maintain pressurizer level. Makeup can be provided by MUPS Trains 1 and 2 or HPIS Trains 1 and 2. The pumps for each train take suction from the BWST. If a HPI pump is used, the pressurizer PORV or the pressurizer vent header is opened to reduce RCS pressure below the shut off head of the pump (1600 PSIG) to provide makeup flow. If alignment of a makeup source is required, then letdown and RCP seal return could initially be isolated to preserve RCS inventory, and returned to service as needed. A modification will be installed to add a makeup source, provided by the FLEX RCS charging pumps and associated equipment. One of the FLEX charging pumps will take suction from the BWST. The other pump will take suction from the Clean Waste Receiver Tanks (CWRTs).

RCS pressure is maintained by operation of the pressurizer heaters to maintain RCS pressure within the Technical Specifications limits. Over-pressurization protection is provided by code safety valves, RC13A and RC13B, which prevent RCS pressure from exceeding 110% of system design pressure.

The integrity of the RCS pressure boundary is maintained by providing RCP seal cooling, controlling thermal stresses in the idle SG and providing diverse means of isolation or administrative control of high/low pressure system interfaces with the RCS.

Decay Heat Removal

The decay heat removal function is capable of removing both decay and latent heat energy from the reactor core and primary systems at a rate such that overall system temperatures can be maintained within acceptable limits.

Decay heat is removed by natural circulation flow from the core to at least one of two steam generators. The heat transfer via the steam generator(s) to the main steam system is controlled by closure of the main steam isolation valves and release of steam to the atmosphere to control RCS temperature. The initial steam release could be via the main steam code safety valves until control of a main steam atmospheric vent valve (AVV) is established.

Steam generator levels are maintained by at least one of three trains of feedwater capable of supplying both steam generators with auxiliary feedwater from the condensate storage tank (CST). The CST is maintained above Technical Specification minimum level to ensure an adequate water supply is available when needed. If required, the auxiliary feedwater pump suctions can be supplied from the service water system. Two trains of feedwater are from turbine-driven auxiliary feedwater pumps, each supplied with main steam to operate. The third train is the motor-driven startup feedwater pump, which is powered from a 4160V bus with diverse power supplies, including emergency diesel generators. A modification will be installed to add a feedwater source, the diesel-driven Emergency Feedwater Pump and associated equipment. This pump will take suction from a new tank located in the Emergency Feed Water (EFW) facility.

Process Monitoring

Process variable instrumentation, required by operators to modify safe shutdown system alignments or to control safe shutdown equipment, are available in the control room or the auxiliary shutdown panel (ASP). The functions monitored are:

• Source Range flux (Locally at electrical penetration area)
• RCS temperature
• RCS pressure
• Pressurizer level
• Steam Generator level
• Steam Generator pressure

Vital Auxiliaries

The systems and equipment used to perform the previous functions require supporting functions. The supporting functions required are process cooling (component cooling water system and service water system), area cooling for certain rooms, and essential AC/DC power. Lubrication is covered as part of the safe shutdown system components. The supporting functions listed below provide the support necessary to assure acceptable performance of the previously identified safe shutdown functions:

• Component Cooling Water System (CCWS)

• Service Water System (SWS)
• Essential Power
• Emergency Diesel Generators
• Heating, Ventilation and Air Conditioning (HVAC)
• Containment Air Cooling System
• Control Room Emergency Ventilation System

The compliance strategies are presented on a fire area basis. Multiple low-risk fire compartments were evaluated together in a single generic fire risk evaluation. These are presented as individual fire compartments in this report with individual EEEE, licensing actions or other items notable to NFPA 805. Because some VFDRs were found to be low-risk and were common to multiple fire compartments, they were considered generically and applied to all fire areas as required.

Fire protection features are discussed in the following B-3 table at only the highest level, where credit is taken for detection, suppression or some special feature. Special features that are credited for NFPA 805 such as cable tray covers, embedded conduits or a transient combustible-free zones, are detailed in LAR Table 4-3. A note in Table B-3 about credited special features indicates when LAR Table 4-3 should be consulted for details.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: A-01 | **Davis-Besse**

Fire Compartment Description: 545' Auxiliary Bldg, Southwest

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. RC2A, PORV, and RC11 Block Valve are operated as required to decrease RCS pressure for use of a High Pressure Injection pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high / low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control Room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1 SG Level-LISP9A1 or LISP9A8A-Idle SG 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-036	Inaccessible Penetration Seals in Barrier 210-E/102-W	The barrier penetrations are sealed with a minimum of 11 inches of silicone foam. With the combustible loading being extremely low along with no normal personnel access creating transient combustibles, the seals are acceptable.
C-FP-013.06-040	Non-rated Equipment Hatches in Barriers 300-F/102-C, 300-F205-C, 300-F/210-C	Based on the design of the subject fire compartments and the design of the hatches, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatches.
C-FP-013.06-119	Non-Rated Opening In Barrier 102-N/209-S Due to FD1101	Non-rated fire damper FD1101 does not reduce the ability of the fire barrier to provide an acceptable level of fire protection for the conditions presented, and is adequate for the hazard.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
FCR 86-0220A Attachment	Fire Damper FD 1101 Evaluation Between Room 102 and 209	Fire Damper 1101 would not decrease the safety of the plant in the event of a fire due to the low combustible fire loadings in both rooms, the circuitous route that a fire would have to take to pose a concern, the HVAC duct having a fire rating of 1-hour, and the presence of detection and suppression in Fire Compartment G-02.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: A-02 | **Davis-Besse**

Fire Compartment Description: 545' Auxiliary Bldg, Southeast

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. RC2A, PORV, and RC11 Block Valve are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high / low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **A-02** — **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-015	12 Inch by 14 Inch Blockout in Barrier 110A-N/113A-S	Fire propagation through this penetration is not credible based on the detection systems, the low combustible loadings, and the lack of significant combustibles near the opening.
C-FP-013.06-055	Temporary Hose in Fire Barrier 241-F/110A-C	The barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated opening, based on defense in depth measures associated with the subject compartments and lack of combustibles near the seal.
C-FP-013.06-059	6 Foot by 5 Foot 6 Inch Equipment Hatch / Ventilation Opening in Barrier	Fire will not propagate due to low combustible loading, fire detection, and cable trays covered with Kaowool fire barriers in one room, and an automatic sprinkler system in the other.
C-FP-013.06-083	Empty 2 Inch Conduit Penetration DNP/117A-C-002	Based on the routing of the conduit through the subject compartments and no combustible loading in the conduit or compartments, the non-rated penetration will not reduce the ability of the barrier to provide an acceptable level of fire protection between the compartments.
C-FP-013.06-093	1/16th Inch Gap in One Penetration in 117-N/232-F	The 1/16th inch gap in one of the penetrations evaluated is negligible and will not reduce the barrier's fire protection capability to an unacceptable level for the subject fire compartments.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

Fire Compartment: A-02 **Davis-Besse**

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: A-03 **Davis-Besse**

Fire Compartment Description: Misc. Waste Monitoring Tank Rm

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. RC2A, PORV, and RC11 Block Valve are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high / low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection
- ERFBS

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: A-04 **Davis-Besse**

Fire Compartment Description: ECCS Pump Rm 1-2

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	DB-0916, DB-0925, DB-2003
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. RC2A, PORV, and RC11 Block Valve are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Local alignment is made for use of CCW Train 1, Letdown and Seal injection. Local CS pump is tripped to maintain BWST inventory. The local trip is credited for Train 2 HPI pump. RCS integrity is maintained by diverse means to control the high / low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0916, DB-0925, DB-1367, DB-1380, DB-1421, DB-1464, DB-1501, DB-1710, DB-1880, DB-2003, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. Local isolation of steam supply is from idle SG 1-2.	DB-0916, DB-0925, DB-1318, DB-1421, DB-1710, DB-2003
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1 SG Level-LISP9A1 or LISP9A8A-Idle SG 1-2-Indicators may fail. SG Pressure-PISP12B or PISP12B2 RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D CCW Surge Tank Level-LI1402	None

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-0916 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0925 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1367 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with no further action required.

VFDR Number DB-1380 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1464 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1501 Thermal stresses in non-credited Steam Generator due to loss of instrumentation.

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1710 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number	DB-1880	Loss of Power to the Non-Credited Emergency Bus Causes Non-Isolable Auxiliary FW Flow to the Non-Credited Steam Generator

Loss of power on the non-credited emergency bus prevents remote isolation of the AFW to the non-credited S/G. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-2003	AFPT Steam Supply Overfeed to Non-credited S/G

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: A-05 — **Davis-Besse**

Fire Compartment Description: Waste Tank Rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2 or HPIS Train 1.	DB-1175, DB-1189, DB-1529, DB-1562, DB-2003
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 or 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1 or 2. RCS integrity is maintained by diverse means to control the high / low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1175, DB-1189, DB-1198, DB-1201, DB-1270, DB-1421, DB-1498, DB-1529, DB-1562, DB-1711, DB-2003, DB-2012
Decay Heat Removal	Steam Generator 1 supplied by Auxiliary Feedpump 1. OR Steam Generator 2 supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1175, DB-1182, DB-1189, DB-1198, DB-1318, DB-1421, DB-1529, DB-1562, DB-1711, DB-2003
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. OR Operate CCW Train 2 and SW Train 2. HVAC credited for MCR, Containment, LVSGR, SW and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14	None

SG Level-LISP9B1 or LISP9B8A SG 1-1
SG Level-LISP9A1-ASP-Idle SG-1-2
SG Pressure-PISP12B or PISP12B2
RCS Makeup MUPS-FI6425 and FI6435
CCW Surge Tank Level-LI1402
Train 2
Nuclear Inst.-NI5875A or NINI1
RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6
RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4
Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LIRC14-4 or LRSRC14
SG Level-LISP9A1 or LISP9A8A-SG 1-2
SG Level-LISP9B1-ASP-Idle SG 1-1
SG Pressure-PISP12A or PISP12A1A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-003	48-Inch By 48-Inch Flood and Vent Path Opening in Barrier 235-E/124-W2	The barrier's ability to provide adequate fire separation has not been reduced to an unacceptable level by the opening.
C-FP-013.06-024	Two 14 Inch Flood Relief Lines in Barriers 124-N/237-S & 124-N/238-S	The barrier is considered adequate based on low combustible loading, the absence of combustibles near the openings, and the tortuous path a fire would have to traverse.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These

Number	Subject	Purpose
	Structural Steel Fireproofing Design and Protection	rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No.1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1175 AFPT Steam Supply Underfeed to Credited Steam Generator - Only One Steam Generator Is Credited But Depends On Fire Location

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1182 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1189 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1198 AFW Feed Flow Underfeed for Credited Steam Generator- Only One Steam Generator is Credited But Depends on Fire Location

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the credited steam generator. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1201 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress in Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1270	Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-1498	Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation - Only One Steam Generator is Non-Credited but Depends on Fire Location

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1529	Excessive Cooldown of RCS from Credited Steam Generator Through AFPT - Only One Steam Generator Is Credited

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number	DB-1562	Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT - Only One Steam Generator Is Non-Credited But Depends On Fire Location

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1711	Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-2003	AFPT Steam Supply Overfeed to Non-credited S/G

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Fire Compartment: **A-06** **Davis-Besse**

Fire Compartment Description: Containment Annulus, East

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. RC2A, PORV, and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Local alignment of CCW Train 1, Letdown and Seal injection. RCS integrity is maintained by diverse means to control the high / low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1117, DB-1367, DB-1394, DB-1421, DB-1501, DB-1769, DB-1906, DB-2012
Decay Heat Removal	Steam Generator 1 supplied by Auxiliary Feedpump 1.	DB-1117, DB-1318, DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation- NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1 SG Level-LISP9A1 or LISP9A8A-Idle SG 1-2-Indicators may fail. SG Pressure-PISP12B or PISP12B2 RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: A-06 | **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection
- ERFBS

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-046	Contaniment Vessel and Its Penetrations	Based on the design of the containment vessel and penetration seals, along with the control of combustible loading and defense in depth measures applied, the vessel and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-048	Divide Annulus Into Two Separate Fire Areas	The ability of each half of the Annulus to function as a separate fire area is not reduced by the subject opening between the two areas.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the Ignition Frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown. There are exposed cables in this compartment; however, these cables are complete runs through the compartment, or they are terminated within sealed junction boxes. Cables themselves are not subject to suppression effects, as there is no credible short-term failure mechanism for them.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1117 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the

NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1367 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1394 Loss of RCS Inventory from Pressurizer Sample and Vent Valves

Fire damage to cables for Pressurizer sample valves and vent valve could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1501 Thermal stresses in non-credited Steam Generator due to loss of instrumentation.

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1769 Loss of RCS Inventory Through High Point Vents

Fire damage to cables for RCS high point vent valves could could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1906 Pressurizer Overfill Due to Loss of Letdown

Water damage due to Spurious Containment Spray, fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **A-07** — **Davis-Besse**

Fire Compartment Description: #2 Mechanical Penetration Rm

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	DB-0994, DB-1162, DB-1182, DB-1531
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. RC2A, PORV, and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0994, DB-1162, DB-1182, DB-1202, DB-1421, DB-1501, DB-1531, DB-1712, DB-2012
Decay Heat Removal	Steam Generator 1 supplied by Auxiliary Feedpump 1. Local control of AFW flow to idle SG 1-2 and AFW flow paths alignment.	DB-0994, DB-1162, DB-1182, DB-1318, DB-1421, DB-1531, DB-1712
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC credited for MCR, Containment, LVSGR, SW and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation- NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1 SG Level-LISP9A1 or LISP9A8A SG 1-2-Indicators may fail. SG Pressure-PISP12B or PISP12B2 RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local	None

indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-005	Two Annular Gaps Between Pipe and Pipe Sleeve in Barrier 227-N2/236-S1	The barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated openings.
C-FP-013.06-031	15 Sq. Ft. Blowout Panel - Penetration No. 235-N-010/236-S2-104	The barrier's ability to provide an acceptable level of fire protection for the conditions involved is not reduced by the unrated opening. This conclusion is supported by low combustible loadings in the rooms, the water curtain protecting the non-rated barrier, and detection.
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-114	Internal Seal for Two Inch Diameter Conduit Penetration	Based on measures in place, it is unlikely for the fire to propagate unsuppressed through the 2-inch conduit to the adjacent subject compartments. The barrier fire protection capability is not reduced to an unacceptable level for the subject fire compartments.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-0994 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1162	AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1182	AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1202	AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1501 Thermal stresses in non-credited Steam Generator due to loss of instrumentation.

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1531 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1712 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: A-08 **Davis-Besse**

Fire Compartment Description: #4 Mechanical Penetration Rm

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	DB-1024, DB-1030, DB-1178, DB-1185, DB-1403, DB-1532, DB-2003
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. RC2A, PORV, and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Local alignment of CCW Train 1, Letdown and Seal injection. Local CS pump trip to maintain BWST inventory. RCS integrity is maintained by diverse means to control the high / low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1023, DB-1024, DB-1025, DB-1027, DB-1028, DB-1029, DB-1030, DB-1031, DB-1033, DB-1178, DB-1185, DB-1199, DB-1203, DB-1268, DB-1270, DB-1403, DB-1421, DB-1532, DB-1711, DB-1751, DB-1880, DB-2003, DB-2012
Decay Heat Removal	Steam Generator 1 supplied by Auxiliary Feedpump 1. Local alignment of steam supplies and AFW flowpaths.	DB-1024, DB-1027, DB-1030, DB-1178, DB-1185, DB-1199, DB-1318, DB-1403, DB-1421, DB-1532, DB-1711, DB-1711, DB-2003
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726, DB-1034, DB-1227, DB-2034
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation- NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4-Indicators may fail.	DB-1401, DB-1409, DB-1654, DB-2033, DB-2034

Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4
Pressurizer Level-LRSRC14-Indicators may fail.
SG Level-LISP9B1 or LISP9B8A-SG 1-1-Indicators may fail.
SG Level-LISP9A1 or LISP9A8A-Idle SG 1-2-Indicators may fail.
SG Pressure-PISP12B-Indicators may fail.
RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D-Indicators may fail.
CCW Surge Tank Level-LI1402

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
11	Embedded Conduits

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection
- ERFBS

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-031	15 Sq. Ft. Blowout Panel - Penetration No. 235-N-010/236-S2-104	The barrier's ability to provide an acceptable level of fire protection for the conditions involved is not reduced by the unrated opening. This conclusion is supported by low combustible loadings in the rooms, the water curtain protecting the non-rated barrier, and detection.
C-FP-013.06-033	Four EVS Ducts in Barrier 427-F/314-C Without Dampers in Place.	Based on the measures in place, low combustible loading in the compartments, and the configuration of the ducts, the four duct openings will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-034	Containment Purge Exhaust Duct in Barrier 427-F/314-C	Based on the defense in depth measures in place, low combustible loading in the compartments, and the exhaust purge pipe configuration, the opening will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-050	6 Blowout Panels In Barrier 314-3/326-W	Based on the design of the blowout panels, the defense in depth measures, and the low combustible fuel loading associated with the subject compartments, the fire protection capability of the barrier is acceptable with the non-rated blowout panels installed.

Number	Subject	Purpose
C-FP-013.06-091	Cable Tray Penetration 427-F-160/314-C1-100	Based on measures in place and the design of the barrier in relation to the penetration configuration, the barrier's fire protection capability is not reduced to an unacceptable level for the subject fire compartments.
C-FP-013.06-092	Cable Tray Penetration 427-F-162/314-C1-093	Based on measures in place and the design of the barrier in relation to the penetration configuration, the barrier's fire protection capability is not reduced to an unacceptable level for the subject fire compartments.
C-FP-013.06-115	Non-rated Opening in Wall / Floor Between Rooms 314 and 426	The crack in the expansion joint is negligible and not significantly deep. Based on measures in place and the low combustible loading in the subject compartments, the barrier's fire protection capability is not reduced to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-12-027, Rev. 0, "Fire Risk Evaluation of No. 4 Mechanical Penetration Room (A-08)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses lines and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

Item Number DB-2032 **Item Title:** SAFE Update for Resolution of Instruments Issues in Fire Compartment A-08

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1023 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1024 Motor-Driven Feed Pump May Cause Non-Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1025 Loss of Pressurizer Heaters For Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1027 Loss of Capability to Trip RCPs from the Control Room While Seal Injection Lost

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1028 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1029 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1030 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1031 Pressurizer Overfill Due to Loss of Letdown

Water damage due to spurious Containment Spray, fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1033 RCS Depressurization Due to Spurious Pressurizer Spray Operation

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1034 Loss of Containment Air Cooling

Fire damage to cables to the containment air cooler fan and/or service water valves could result in a loss of containment atmospheric cooling. This could affect RCS system instrumentation used to achieve and maintain safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1178 AFPT Steam Supply Underfeed to Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1185 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1199 AFW Feed Flow Underfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the credited steam generator. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1203 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1227 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1268 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number DB-1401 Loss of Steam Generator Pressure Indication

Loss of Steam Generator pressure indications could occur on battery depletion if D1_EA is lost and not recovered, fire damage of cables and/or due to water damage to the pressure transmitters cause by spurious Containment Spray. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1403 Motor-Driven Feed Pump may Cause Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the credited steam generator This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1409 No Pressurizer Level Indication Available in Control Room

Loss of control room pressurizer level indication could occur due to water damage to the pressure transmitters caused by spurious Containment Spray. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1532 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number DB-1654 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1711 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1751 Loss of Credited Steam Generator Level Indication With Spurious Containment Spray

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables could cause loss of level indication for credited S/G water level. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1880 Loss of Power to the Non-Credited Emergency Bus Causes Non-Isolable Auxiliary FW Flow to the Non-Credited Steam Generator

Loss of power on the non-credited emergency bus prevents remote isolation of the AFW to the non-credited S/G. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2003 AFPT Steam Supply Overfeed to Non-credited S/G

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

VFDR Number DB-2033 Instrument Modification - Fire Compartment A-08

Instruments required in Fire Compartment A-08 may fail due to spurious containment spray (See DB-2032 & DB-2034 for additional information). A modification to the transmitters will be implemented to ensure the following instruments can provide accurate indications to the Control Room following a spurious containment spray event:

- LISP9A8A - SG2 LCH2 SFRCS/CTRM LVL INDICATOR (VFDR DB-1028)
  + Transmitter LTSP9A8
- LISP9B8A - SG1 LCH1 SFRCS/CTRM LVL INDICATOR (VFDR DB-1751)
  + Transmitter LTSP9B8
- LRSRC14 - PRESSURIZER LEVEL INCHES COMPENSATED (VFDR DB-1409)
  + Transmitter LTRC14-2
- PISP12B2 - PRESSURE INDICATOR FOR SG1 (VFDR DB-1401)
  + Transmitter PTSP12B2
- TIRC4B2 - RC LOOP 1 CLG WR TEMP INDICATOR (VFDR DB-1654)
  + Transmitter TERC4B2

This modification will be tracked for implementation under LAR Att. S.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR.

VFDR Number DB-2034 Recovery Action to Start and Load Train 2 EDG in Fire Compartment A-08

Recovery Action required to start and load Train 2 EDG to charge Train 2 battery in Fire Compartment A-08 (See DB-2032 & DB-2033 for additional information) before battery depletion (1 hour). The battery provides power to the following instruments:

- LISP9A8A - SG2 LCH2 SFRCS/CTRM LVL INDICATOR (VFDR DB-1028)
- LRSRC14 - PRESSURIZER LEVEL INCHES COMPENSATED (VFDR DB-1409)
- PISP12B2 - PRESSURE INDICATOR FOR SG1 (VFDR DB-1401)
- TIRC4B2 - RC LOOP 1 CLG WR TEMP INDICATOR (VFDR DB-1654)

Recovery Action for this VFDR will be included in LAR Att. G.

Procedure steps will be developed during implementation to start and load the Train 2 EDG in Fire Compartment A-08. This will be tracked for implementation under LAR Att. S.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: A-09 — **Davis-Besse**

Fire Compartment Description: Auxiliary Bldg Cable Chases, 115CC and 314CC

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	DB-0994, DB-1163, DB-1183, DB-1185, DB-1531
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. RC2A, PORV, and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Local alignment of CCW Train 1, Letdown and Seal injection. Local CS pump trip to maintain BWST inventory. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0992, DB-0994, DB-1163, DB-1183, DB-1185, DB-1268, DB-1367, DB-1381, DB-1392, DB-1421, DB-1502, DB-1531, DB-1656, DB-1711, DB-1750, DB-1751, DB-2012
Decay Heat Removal	Steam Generator 1 supplied by Auxiliary Feed Pump 1. Local alignment of steam supplies and AFW flowpaths.	DB-0994, DB-1163, DB-1183, DB-1185, DB-1318, DB-1421, DB-1531, DB-1711
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726, DB-1227, DB-1707
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot leg Temperature-TIRC3B5 RCS Cold leg Temperature-TIRC4B2 or TIRC4B4-Indicators may fail. Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14-Indicators may fail. SG Level-LISP9B1 or LISP9B8A-SG 1-1 - Available at ASP. SG Level-LISP9A1 or LISP9A8A-Idle SG 1-2-Indicators may fail. SG Pressure-PISP12B or PISP12B2 - Available at ASP. RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D	DB-1657, DB-1708

CCW Surge Tank Level-LI1402

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-0992 Pressurizer Overfill Due to Excessive Flow from Non-Credited High Pressure Injection (HPI) Pump Following RCS Depressurization

Fire damage to cables for the high pressure injection pump and high pressure injection line isolation valves could result in pressurizer overfill due to loss of control room capability to stop the pump or close valves when RCS pressure is less than shutoff head of the high pressure injection pump. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0994 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1163 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1183 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1185 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1227 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1268 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1367 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1381 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1392 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1502 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1531 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1656 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1657 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1707 Loss of Steam Generator Pressure Indication

Loss of Steam Generator pressure indications could occur on battery depletion if D1_EA is lost and not recovered, fire damage of cables and/or due to water damage to the pressure transmitters cause by spurious Containment Spray. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1708 No Pressurizer Level Indication Available in Control Room

Loss of control room pressurizer level indication could occur due to water damage to the pressure transmitters caused by spurious Containment Spray. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1711 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1750 Loss of Credited Steam Generator Level Indication

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables could cause loss of level indication for credited S/G water level. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1751 Loss of Credited Steam Generator Level Indication With Spurious Containment Spray

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables could cause loss of level indication for credited S/G water level. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **AB-01** **Davis-Besse**

Fire Compartment Description: ECCS Pump Rm 1-1 & DHR Cooler Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1534
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC200, High Point Pressurizer Vent, and RC239A, Pressurizer Vent to Quench Tank, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. Local CS pump trip to maintain BWST inventory. Local trip of Makeup Train 1 to stop pressurizer increase. Local trip of HPI pump prior to depressurization. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1013, DB-1014, DB-1119, DB-1270, DB-1421, DB-1476, DB-1534, DB-1713, DB-2012
Decay Heat Removal	Steam Generator 2 supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1014, DB-1318, DB-1421, DB-1534, DB-1713
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726, DB-1014
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Level-LISP9B1 or LISP9B8A-Idle SG 1-1-Indicators may fail. SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403	DB-0988

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-015	12 Inch by 14 Inch Blockout in Barrier 110A-N/113A-S	Fire propagation through this penetration is not credible based on the detection systems, the low combustible loadings, and the lack of significant combustibles near the opening.
C-FP-013.06-020	15 Foot 1/2 Inch by 5 Foot 6 Inch Equipment Hatch in Barrier 227-F/113A-C	The evaluation concludes that the ability of the barrier between compartments AB-01 and G-02 is not reduced to an unacceptable level by the non-rated hatch opening.
C-FP-013.06-062	10" High Density Elastomer Wall Barrier Seals	Based on the design of a High Density Elastomer (HDE) seal in a wall barrier, an effective seal material depth of 10 inches is an acceptable 3-hour fire seal.
C-FP-013.06-063	Duct Penetration	The Radwaste Area Exhaust System penetrates the stairwell in two locations, one of which has a damper. Combustible loading is very low on both sides of the barrier; therefore, the lack of damper is acceptable.
C-FP-013.06-070	1/8 Inch Annular Gap in Barrier AB3-N/105-S	The annular gap is negligible, and fire protection for the subject fire compartments is not reduced due to the unrated opening. The gap is too small to be filled with material complying with a tested configuration.
C-FP-013.06-096	Structural Steel Fireproofing of Columns in Room 105	The fireproofing material could not be applied to the thickness required by plant procedures to the structural steel in the subject fire compartment, where equipment is attached to the steel. The missing amount is negligible and will not impact the fire rating capability.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1013	Pressurizer Overfill Due to Excessive Flow from Non-Credited High Pressure Injection (HPI) Pump Following RCS Depressurization

Fire damage to cables for the high pressure injection pump and high pressure injection line isolation valves could result in pressurizer overfill due to loss of control room capability to stop the pump or close valves when RCS pressure is less than shutoff head of the high pressure injection pump. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1014	Loss of Credited 4160V Bus D1 - Makeup Pump OCT

Fire could damage the non-credited makeup pump (P37-2) resulting in loss of power to the credited 4160V bus (D1_EA). This bus provides power to systems required for RCS inventory and pressure control and decay heat removal. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1119	Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1270	Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1476 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1534 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1713 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **AB-02** **Davis-Besse**

Fire Compartment Description: Containment Annulus, West

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC200, High Point Pressurizer Vent, and RC239A, Pressurizer Vent to Quench Tank, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Local alignment of CCW Train 2, Letdown and Seal injection or RCS cooldown to less than 350 deg F. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1119, DB-1120, DB-1375, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 supplied by Auxiliary Feedpump 2. Local alignment of steam supplies.	DB-1120, DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation- NI5875A or NINI1 RCS Hot leg Temperature- TIRC3A6 RCS Cold leg Temperature- TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure- PIRC2A3 or PIRC2A4 Pressurizer Level - LIRC14-4 or LRSRC14 SG Level- LISP9A1 or LISP9A8A-S/G 1-2 SG Level- LISP9B1 or LISP9B8A-Idle S/G 1-1-Indicators may fail. SG Pressure- PISP12A or PISP12A1A RCS Makeup Flow HPIS- FYIHP3A and FYIHP3B CCW Surge Tank Level- LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local	DB-0988

indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-046	Contaniment Vessel and Its Penetrations	Based on the design of the containment vessel and penetration seals, along with the control of combustible loading and defense in depth measures applied, the vessel and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-048	Divide Annulus Into Two Separate Fire Areas	The ability of each half of the Annulus to function as a separate fire area is not reduced by the subject opening between the two areas.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1119 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1120 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the

NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1375 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: AB-03 **Davis-Besse**

Fire Compartment Description: #1 Mechanical Penetration Rm

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1234
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV, and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and local isolation of RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Local alignment of CCW Train 2, Letdown and Seal injection. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1127, DB-1128, DB-1234, DB-1270, DB-1375, DB-1421, DB-1466, DB-2012
Decay Heat Removal	Steam Generator 2 supplied by Auxiliary Feedpump 2.	DB-1234, DB-1318, DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1127 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1128 Loss of Control Room Capability to Isolate Seal Water Return

Fire damage to cables for RCP seal return isolation valves could result in the loss of control room capability to isolate RCP seal return to the makeup tank resulting in an increase in demand for RCS makeup from the BWST. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1234 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Bypass Valves

Fire damage to control circuits for MSIV Bypass Valves could result in spurious opening and excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1375 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1466 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and

Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **AB-04** **Davis-Besse**

Fire Compartment Description: 565' Auxiliary Bldg, Make-up Pump Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1534
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV, and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. Local trip of Makeup Train 1 and Train 2 to stop pressurizer increase. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1305, DB-1421, DB-1467, DB-1534, DB-1714, DB-2004, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. There is local alignment of steam supplies.	DB-1305, DB-1318, DB-1421, DB-1534, DB-1714
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726, DB-1305
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-Indicators may fail. SG Pressure-PISP12A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403	DB-0988

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-097	Structural Steel Fireproofing in Makeup Pump Room, RM 225	The fireproofing material could not be applied to the thickness required by plant procedures to the structural steel in the subject fire compartment, where equipment is attached to the steel. The missing amount is negligible and will not impact the fire rating capability.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-12-045, Rev. 0, "Fire Risk Evaluation of Make-Up Pump Room (AB-04)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1305 Loss of Credited 4160V Bus D1 - Makeup Pump OCT

Fire could damage the non-credited makeup pump (P37-2) resulting in loss of power to the credited 4160V bus (D1_EA). This bus provides power to systems required for RCS inventory and pressure control and decay heat removal. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1467 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1534 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1714 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2004 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: AB-05 — **Davis-Besse**

Fire Compartment Description: #3 Mechanical Penetration Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1235, DB-1534
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC200, High Point Pressurizer Vent, and RC239A, Pressurizer Vent to Quench Tank, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Local alignment of CCW Train 2, letdown and seal injection, and local CS pump and Makeup Train 2 trip to maintain BWST inventory. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle steam generator tube sheet.	DB-1235, DB-1258, DB-1270, DB-1290, DB-1375, DB-1383, DB-1421, DB-1468, DB-1534, DB-1659, DB-1682, DB-1711, DB-1873, DB-1930, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feed Pump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1235, DB-1290, DB-1318, DB-1421, DB-1534, DB-1711
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for Control Room, Containment, SW, and AFW pump rooms. HVAC for LVSGR may fail.	DB-0726, DB-1217, DB-1342
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4-Indicators may fail. Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-Idle S/G-1-2 SG Level-LISP9B1 or LISP9B8A-S/G 1-1-Indicators may fail. SG Pressure-PISP12A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403	DB-0988, DB-1658

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-039	Containment Supply Duct in Barrier 500-F/303 PC-C	Based on the defense in depth measures in place, low combustible loading in the compartments, and the purge supply duct configuration, the opening will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppressions was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1217 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1235 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Bypass Valves

Fire damage to control circuits for MSIV Bypass Valves could result in spurious opening and excessive RCS cooldown. This could challenge the NSPC for

Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1258 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1290 Loss of Capability to Trip RCPs from the Control Room When Seal Injection and Thermal Barrier Cooling Lost

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1342 Loss of Low Voltage Switchgear HVAC

Fire could damage cables for ventilation controls or close dampers due to fire effects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1375 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1383 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1468 Pressurizer Overfill Due to Loss of Letdown

Water damage due to Spurious Containment Spray, fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1534 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a

separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1658 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1659 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1682 Loss of RCS Inventory Via the Letdown Flow Path with Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cables of valves in the letdown flow path could result a loss of control room capability to close one of the valves to stop RCS inventory loss. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1711 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1873 Loss of Control Room Capability to Isolate Seal Water Return

Fire damage to cables for RCP seal return isolation valves could result in the loss of control room capability to isolate RCP seal return to the makeup tank resulting in an increase in demand for RCS makeup from the BWST. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1930 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **AB-06** **Davis-Besse**

Fire Compartment Description: Auxiliary Bldg Stairwell AB-3A

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV, and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet	DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-063	Duct Penetration	The Radwaste Area Exhaust System penetrates the stairwell in two locations, one of which has a damper. Combustible loading is very low on both sides of the barrier; therefore, the lack of damper is acceptable.
C-FP-013.06-070	1/8 Inch Annular Gap in Barrier AB3-N/105-S	The annular gap is negligible, and fire protection for the subject fire compartments is not reduced due to the unrated opening. The gap is too small to be filled with material complying with a tested configuration.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: AC-01 **Davis-Besse**

Fire Compartment Description: BWST & PWST pipe trenches

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-1931
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-1931, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421, DB-1931
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Fire Compartment: AC-01 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses lines and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1931 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOV could result in the loss of control room capability to control steam to the auxiliary feed pump turbine. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: AD-01 **Davis-Besse**

Fire Compartment Description: Elevator EL3, Stairwell AB2, and Machinery Room 118

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 and 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1 or 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. And Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. And Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NI5874A or NINI2 RCS Hot Leg Temp.-TIRC3B5 or TIRC3B6 RCS Cold Leg Temp.-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G-1-2 SG Pressure-PISP12B or PISP12B2	None

RCS Makeup MUPS-FI6425 and FI6435
CCW Surge Tank Level-LI1402
Train 2
Nuclear Inst.-NI5875A or NINI1
RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6
RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4
Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LIRC14-4 or LRSRC14
SG Level-LISP9A1 or LISP9A8A-SG 1-2
SG Level-LISP9B1 or LISP9B8A-Idle SG 1-1
SG Pressure-PISP12A or PISP12A1A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electricity.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses lines and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: B-01 — **Davis-Besse**

Fire Compartment Description: Equipment Pipe Chase and Pipe Tunnel

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and S/W Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- None

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-062	10" High Density Elastomer Wall Barrier Seals	Based on the design of a High Density Elastomer (HDE) seal in a wall barrier, an effective seal material depth of 10 inches is an acceptable 3-hour fire seal.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number	DB-1270	Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: BD-01 **Davis-Besse**

Fire Compartment Description: Screenwash Pump Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-011	Unsealed 3/4" Flexible Conduit in Barrier 51-E/54-W	Based on the defense in depth design of the subject fire areas, the barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated opening.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number	DB-1270	Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: BE-01 **Davis-Besse**

Fire Compartment Description: Diesel Fire Pump Room and DFP Day Tank Enclosure

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: BE-01 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-004	35 Inch by 45 Inch Diesel FP Room Ventilation Opening Barrier 51-W/52A-E Vent Fan Enclosure	The barrier provides an acceptable level of fire protection because a fire sprinkler has been added to protect the opening.
C-FP-013.06-008	Low Density Silicone Foam Seals in an 8" Wall, Barrier 52-N/51-S	Based on the design of the subject fire areas, the ability of the barrier to provide an acceptable level of fire protection is not reduced by the non-rated seal designs.
C-FP-013.06-011	Unsealed 3/4" Flexible Conduit in Barrier 51-E/54-W	Based on the defense in depth design of the subject fire areas, the barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated opening.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **BF-01** **Davis-Besse**

Fire Compartment Description: Service Water Pump Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-0916, DB-0925, DB-2003
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0916, DB-0922, DB-0925, DB-1270, DB-1421, DB-1710, DB-1879, DB-2003, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. There is local alignment of steam supplies.	DB-0916, DB-0925, DB-1318, DB-1421, DB-1710, DB-2003
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Ensure local alignment of SW and C1 4KV Bus.	DB-0914, DB-0915, DB-1289
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1 SG Level-LISP9A1 or LISP9A8A-Idle SG 1-2-Indicators may fail. SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-004	35 Inch by 45 Inch Diesel FP Room Ventilation Opening Barrier 51-W/52A-E Vent Fan Enclosure	The barrier provides an acceptable level of fire protection because a fire sprinkler has been added to protect the opening.
C-FP-013.06-008	Low Density Silicone Foam Seals in an 8" Wall, Barrier 52-N/51-S	Based on the design of the subject fire areas, the ability of the barrier to provide an acceptable level of fire protection is not reduced by the non-rated seal designs.
C-FP-013.06-060	24 Inch Cooling Tower Makeup Line Through Barrier 53-E/52-W	The barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated pipe sleeve/support design.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0914 Loss of All Service Water Pumps

Fire could damage service water pumps resulting in the loss of cooling to the CCW, CREVS and CAC systems. These are required to remove heat from systems required to achieve and maintain RCS inventory and pressure control and decay heat removal. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0915 Loss of Credited C1 4160V Bus - Service Water Pump OCT

Fire could damage the service water pump resulting in the loss of power to C1 4160V bus. This bus provides power to systems required for RCS inventory and pressure control and decay heat removal. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0916 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0922 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-0925 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1289 Loss of Credited C2 4160V Bus Due to Cooling Tower Pump Over Current Trip

Fire damage to the cooling water tower makeup pump could result in a loss of power on C2 bus. With C1 bus being supplied from offsite power via C2 bus, C1 bus is lost due to loss of C2. C1 is required to power systems required for RCS inventory and pressure control, decay heat removal and loss of auxiliary system (service water, CCW and the EDG). This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1710 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1879 Loss of the Non-Credited Emergency Bus Causing Non-Credited Steam Generator Overfeed

Fire could damage cables on the non-credited emergency bus resulting in loss of the bus. The loss of power prevents remote isolation of the AFW to the non-credited S/G. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2003 AFPT Steam Supply Overfeed to Non-credited S/G

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: BG-01 — **Davis-Besse**

Fire Compartment Description: Service Water Pipe Tunnel and Valve Rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-0916, DB-0925, DB-2003
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0916, DB-0922, DB-0925, DB-1270, DB-1421, DB-1716, DB-1879, DB-2003, DB-2012
Decay Heat Removal	Steam Generator 1 supplied by Auxiliary Feedpump 1. Local alignment of steam supplies.	DB-0916, DB-0925, DB-1318, DB-1421, DB-1716, DB-2003
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Local alignment of SW.	DB-0924
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2-Indicators may fail. SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection
- ERFBS

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-025	Floor Drain Under Fire Door No. 111 in Barrier 053-N/015-S	Based on the small size and material construction of the drain and the defense in depth measures in place, the barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated opening.
C-FP-013.06-035	Fire Door 219 and LDF and HDE Seals Barrier 251-N/334-S5	An unrated, self-closing hollow metal door of substantial construction has been installed and is electronically monitored. Blockouts are sealed with silicone foam, which will provide fire resistance. Door and penetration designs are acceptable due to low combustible loading, as well as automatic suppression.
C-FP-013.06-060	24 Inch Cooling Tower Makeup Line Through Barrier 53-E/52-W	The barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated pipe sleeve/support design.
C-FP-013.06-061	Several Seals in Barrier 053A-N/015-S	All pipe sleeves are filled with silicon foam. One duct is open without a damper, but is acceptable. The combustible loading is very low on both sides and would not challenge the seals.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0916 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0922 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-0924 Service Water Pump Runout Condition and Loss of Adequate CCW Cooling

Fire could damage cables to SW1399 resulting in runout of the operating service water pump and the loss of cooling to the CCW, CREVS and CAC systems. Service Water is required to remove heat from systems required to achieve and maintain RCS inventory and pressure control and decay heat removal. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0925 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1716 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1879 Loss of the Non-Credited Emergency Bus Causing Non-Credited Steam Generator Overfeed

Fire could damage cables on the non-credited emergency bus resulting in loss of the bus. The loss of power prevents remote isolation of the AFW to the non-credited S/G. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2003 AFPT Steam Supply Overfeed to Non-credited S/G

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: BH-01 **Davis-Besse**

Fire Compartment Description: Water Treatment Building

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 or 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1 or 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. And Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402	None

Train 2
Nuclear Inst.-NI5875A or NINI1
RCS Hot Leg Temp.-TIRC3A5 or TIRC3A6
RCS Cold Leg Temp.-TIRC4A2 or TIRC4A4
Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LIRC14-4 or LRSRC14
SG Level-LISP9A1 or LISP9A8A-S/G 1-2
SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1
SG Pressure-PISP12A or PISP12A1A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-025	Floor Drain Under Fire Door No. 111 in Barrier 053-N/015-S	Based on the small size and material construction of the drain and the defense in depth measures in place, the barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated opening.
C-FP-013.06-061	Several Seals in Barrier 053A-N/015-S	All pipe sleeves are filled with silicon foam. One duct is open without a damper, but is acceptable. The combustible loading is very low on both sides and would not challenge the seals.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: BM-01 — **Davis-Besse**

Fire Compartment Description: Diesel Oil Pumphouse

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **BM-01** | **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the Ignition Frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown, with the exception of the Diesel Oil Transfer Pump, P8-1. However, P8-1 is only needed during a fire in fire compartments BN-01, ME-01 and MF-01. Therefore, when P8-1 would be required, no suppression would be impinging upon it, and it would be able to perform its function.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number	DB-1270	Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **BN-01** **Davis-Besse**

Fire Compartment Description: EDG Week Tanks

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: BN-01 | **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the Ignition Frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA to support safe shutdown.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number	DB-1270	Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: CC-01 **Davis-Besse**

Fire Compartment Description: Old RRA Access and Chemistry Lab Areas

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1164, DB-1184, DB-1236, DB-1538, DB-1539, DB-1923, DB-1925
Inventory and Pressure Control	RCS pressure is maintained by local trip of Essential Bank 1 and local operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV, is operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. RC11, Block Valve, loses power so remains open. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Local alignment of CCW Train 2, letdown and seal injection. Cooldown could be required with local trip of HPIS Train 1 if CCW cannot be restored. Local CS pump trip to maintain BWST inventory. Local trip of Makeup Train 1 to stop pressurizer increase. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1013, DB-1164, DB-1184, DB-1236, DB-1258, DB-1270, DB-1296, DB-1350, DB-1375, DB-1384, DB-1421, DB-1469, DB-1477, DB-1484, DB-1538, DB-1539, DB-1675, DB-1683, DB-1764, DB-1923, DB-1924, DB-1925, DB-1930, DB-2012
Decay Heat Removal	Steam Generator 2 supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1164, DB-1184, DB-1236, DB-1318, DB-1421, DB-1538, DB-1539, DB-1923, DB-1925
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-1217
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14	DB-0988, DB-1661

SG Level-LISP9A1-S/G 1-2
SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-Indicators may fail.
SG Pressure-PISP12A
RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-007	Two Annular Gaps Around Conduits in Barrier 404-E/411-W1	The annular gaps are negligible, and the fire protection for Fire Compartments V-01 and CC-01 is not reduced due to the unrated openings. The gaps are too small to be filled with material complying with a tested configuration.
C-FP-013.06-029	Non-rated Opening Justification for LDF Penetrations in Barrier 421-F/328-C	The barrier's ability to provide an acceptable level of fire protection for the conditions involved is not reduced by the non-rated seal configurations.
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-082	2-Inch Conduit Sleeve Penetration 426-N-003/427-S2-039	The evaluation concludes that the barrier effectiveness is not reduced for the non-rated seal configuration. There is limited combustible loading and automatic fire detection in both rooms, along with automatic fire suppression in one room.
C-FP-013.06-084	5 Inch Core Drill Penetration 412/412A-F-011/310-C-119	Based on the measures in place and the low combustible fuel loading equating to a fire duration of less than 10 minutes, the subject barrier is not reduced to an unacceptable level due to the non-rated penetration.
C-FP-013.06-087	Gap in Wall / Ceiling 421-E/AB-1W	Based on the measures in place and low combustible loading in the subject compartments, the non-rated gap does not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-115	Non-rated Opening in Wall / Floor Between	The crack in the expansion joint is negligible and not significantly deep. Based on measures

Number	Subject	Purpose
	Rooms 314 and 426	in place and the low combustible loading in the subject compartments, the barrier's fire protection capability is not reduced to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1013	Pressurizer Overfill Due to Excessive Flow from Non-Credited High Pressure Injection (HPI) Pump Following RCS Depressurization

Fire damage to cables for the high pressure injection pump and high pressure injection line isolation valves could result in pressurizer overfill due to loss of control room capability to stop the pump or close valves when RCS pressure is less than shutoff head of the high pressure injection pump. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1164	AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1184	AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1217	Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1236	Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Bypass Valves

Fire damage to control circuits for MSIV Bypass Valves could result in spurious opening and excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1258 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1296 Loss of Control Room Capability to Isolate Seal Water Return

Fire damage to cables for RCP seal return isolation valves could result in the loss of control room capability to isolate RCP seal return to the makeup tank resulting in an increase in demand for RCS makeup from the BWST. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1350 Loss of Pressurizer Heaters for Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1375 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1384 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1469 Pressurizer Overfill Due to Loss of Letdown

Water damage due to Spurious Containment Spray, fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1477 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1484 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1538 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1539 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1661 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1675 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1683 Loss of RCS Inventory Via the Letdown Flowpath with Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cables of valves in the letdown flow path could result a loss of control room capability to close one of the valves to stop RCS inventory loss. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1764 Loss of RCS Inventory Through High Point Vents

Fire damage to cables for RCS high point vent valves could could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1923 Loss of Automatic and Timely Control Room Trip Capability of the Main Turbine

Fire damage could result in loss of ability to trip the Main Turbine from the Control Room. This could challenge the NSPC for Decay Heat Removal, Inventory and Pressure Control and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1924 Spurious Safety Features Actuation Signal (SFAS)

Fire damage to cables for the RCS Pressure signal, Containment Pressure signal and/or the Logic Panel could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1925 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1930 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: D-01 **Davis-Besse**

Fire Compartment Description: Containment

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of the available Essential Bank 1 or 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Makeup Train 1 or 2 with suction from the BWST. Local alignment of CCW Train 1 or 2, letdown and seal injection. Local CS pump is tripped to maintain BWST inventory. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1286, DB-1395, DB-1398, DB-1421, DB-1470, DB-1499, DB-1516, DB-1639, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1, or Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies.	DB-1286, DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. OR Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726, DB-1887
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NI5874A RCS Hot Leg Temp.-TIRC3B5 RCS Cold Leg Temp.-TIRC4B4 Reactor Coolant System Pressure-PI6365B Pressurizer Level-LIRC14-3 SG Level-LISP9B1-S/G 1-1 SG Level-LISP9A1-Idle S/G 1-2-Indicator may fail. SG Pressure-PISP12B RCS Makeup MUPS-FI6425 and FI6435	None

CCW Surge Tank Level-LI1402
Train 2
Nuclear Inst.-NI5875A
RCS Hot Leg Temp.-TIRC3A5
RCS Cold Leg Temp.-TIRC4A4
Reactor Coolant System Pressure-PI6365A
Pressurizer Level-LIRC14-4
SG Level-LISP9A1-S/G 1-2
SG Level-LISP9B1-Idle S/G 1-1
SG Pressure-PISP12A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
12	Reactor Coolant Pumps Oil Collection System

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-046	Contaniment Vessel and Its Penetrations	Based on the design of the containment vessel and penetration seals, along with the control of combustible loading and defense in depth measures applied, the vessel and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-044, Rev. 0, "Fire Compartment D-01"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Impacts to equipment due to manual firefighting activities are not expected to result in additional fire damage states. The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and portable extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. This compartment is not provided with an automatic suppression system.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1286 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1395 Loss of RCS Inventory from Pressurizer Sample and Vent Valves

Fire damage to cables for Pressurizer sample valves and vent valve could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1398 Loss of RCS Inventory Through High Point Vents

Fire damage to cables for RCS high point vent valves could could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1470 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number DB-1499 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation - Only One Steam Generator is Non-Credited but Depends on Fire Location

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1516 Loss of Pressurizer Heaters for Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1639 Challenge to RCP Seals Due to Loss of Seal Cooling

Fire damage of cables to CCW valves to the RCP seal coolers could result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1887 Loss of All Containment Cooling Due to Loss of Fans

Fire damage to cables to the containment air cooler fan and/or service water valves could result in a loss of containment atmospheric cooling. This could affect RCS system instrumentation used to achieve and maintain safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **DD-01** **Davis-Besse**

Fire Compartment Description: Cable Spreading Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-1160, DB-1165, DB-1179, DB-1185, DB-1237, DB-1404, DB-1406, DB-1493, DB-1540, DB-1573, DB-1616, DB-1831, DB-2009
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. Local trip of pressurizer heaters Group 1,2,3,4 and Essential Bank 2 could be required. RCS inventory is maintained by local isolation of letdown and RCP seal return. Makeup is provided by local alignment of Makeup Train 1 with suction from the BWST. Local alignment of Seal injection, Letdown and CCW Train 1. Local trip of both trains of makeup pumps, HPI pumps and CS pumps. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1160, DB-1165, DB-1179, DB-1185, DB-1199, DB-1204, DB-1237, DB-1242, DB-1260, DB-1352, DB-1385, DB-1393, DB-1396, DB-1399, DB-1404, DB-1406, DB-1421, DB-1460, DB-1471, DB-1478, DB-1486, DB-1493, DB-1496, DB-1526, DB-1540, DB-1573, DB-1616, DB-1620, DB-1621, DB-1676, DB-1684, DB-1765, DB-1826, DB-1829, DB-1830, DB-1831, DB-1833, DB-1840, DB-2009, DB-2012
Decay Heat Removal	Steam Generator 1 supplied by Auxiliary Feed Pump 1. Local alignment of steam supplies and AFW flowpaths.	DB-1160, DB-1165, DB-1179, DB-1185, DB-1199, DB-1237, DB-1242, DB-1318,

		DB-1404, DB-1406, DB-1421, DB-1493, DB-1496, DB-1526, DB-1540, DB-1573, DB-1826, DB-1829, DB-1830, DB-1831, DB-2009
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Temporary ventilation may be needed. Control room evacuation could be required.	DB-1207, DB-1218, DB-1229, DB-1246, DB-1293, DB-1303, DB-1306, DB-1343, DB-1491, DB-1828, DB-1832
Process Monitoring	ASP and local indicators are available for: Nuclear Instrumentation-NI5874C-Local Source Range Indicator. RCS Hot Leg Temperature-TERC3B5-Room 303 RCS Cold Leg Temperature-TERC4B3-Room 303-Indicator may fail. Reactor Coolant System Pressure-PI6365B1-ASP Pressurizer Level-LIRC14-1-ASP SG Level-LISP9B3-S/G 1-1-ASP SG Level-LISP9A3-S/G 1-2-ASP-Idle SG SG Pressure-PISP12B1-SG 1-1-ASP RCS Makeup MUPS-Use pressurizer level indication CCW Surge Tank Level-LI1402-Indicator may fail. Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	DB-1523, DB-1660, DB-1665

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: DD-01 **Davis-Besse**

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-039, Rev. 2, "Fire Risk Evaluation of Cable Spreading Room (DD-01)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02508, Rev. 16, "Control Room Evacuation"
- DB-OP-02519, Rev. 21, "Serious Control Room Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at DBNP Station"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1160 AFPT Steam Supply Overfeed to Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number	DB-1165	AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1179	AFPT Steam Supply Underfeed to Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1185	AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1199	AFW Feed Flow Underfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the credited steam generator. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1204	AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1207 CC Flow Diverted through Decay Heat Removal Exchanger

Fire damage to cables could affect the ability to isolate non-essential CCW, thereby causing CCW pump runout. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1218 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1229 Control Room Evacuation and Re-Energizing Essential Bus

Fire damage to control and power circuits for the Essential Bus 4.16 KV and 480 V components. Fire damage could prevent the automatic restoration of the Essential Bus. This could challenge the NSPC for Vital Auxilaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1237 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Valves and Bypass Valves

Fire damage to control circuits could result in MSIV failure to close and MSIV bypass spurious opening causing excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1242 Loss of All AFW Due to Spurious Steam and Feed Rupture Control System (SFRCS) Signal

Fire damage to cables for "FEED-ONLY-GOOD- GENERATOR (FOGG)" could result in loss of AFW to the credited and non-credited S/Gs. Feed must be restored quickly to the credited S/G. Feed must be restored to regain non-credited S/G level within 6 hours following a S/G dry out condition to prevent failure of S/G tubes due to thermal stress of the tube sheet. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1246 Loss of Automatic and Timely Control Room Trip Capability of the Main Generator Output Breakers

Fire damage to electrical cables could result in the loss of automatic and control room capability to isolate the main generator from the electrical grid following a turbine trip. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1260 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1293 Loss of Containment Air Cooling

Fire damage to cables to the containment air cooler fan and/or service water valves could result in a loss of containment atmospheric cooling. This could affect RCS system instrumentation used to achieve and maintain safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1303 Loss of Credited 4160V Bus C1

Fire damage to cables to the credited EDG could prevent the EDG from starting which would require a manual start. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1306 Loss of Credited Bus C1 Due to Cooling Water to EDG

Fire could damage cables to equipment needed to support EDG which could lead to loss of EDG. This could challenge the NSPC for Vital Auxiliaries. This is a

separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1343 Loss of Low Voltage Switchgear HVAC

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1352 Loss of Pressurizer Heaters for Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1385 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1393 Loss of RCS Inventory from PORV

Fire damage to cables could cause spurious operation of PORV. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1396 Loss of RCS Inventory from Pressurizer Sample and Vent Valves

Fire damage to cables for Pressurizer sample valves and vent valve could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1399 Loss of RCS Makeup Capability Due to Lost Amp Meters

Fire damage could result in loss of indication of amps being drawn by motor, thereby allowing runout of make-up pump. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1404 Motor-Driven Feed Pump may Cause Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the credited steam generator This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1406 Motor-Driven Feed Pump may Cause Non-Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1460 Pressurizer Overfill Due to Excessive Flow from Non-Credited High Pressure Injection (HPI) Pump Following RCS Depressurization

Fire damage to cables for the high pressure injection pump and high pressure injection line isolation valves could result in pressurizer overfill due to loss of control room capability to stop the pump or close valves when RCS pressure is less than shutoff head of the high pressure injection pump. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1471 Pressurizer Overfill Due to Loss of Letdown

Water damage due to Spurious Containment Spray, fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1478 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1486 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1491 Service Water Pump Runout Condition and Loss of Adequate CCW Cooling

Fire could damage cables to SW1399 resulting in runout of the operating service water pump and the loss of cooling to the CCW, CREVS and CAC systems.

Service Water is required to remove heat from systems required to achieve and maintain RCS inventory and pressure control and decay heat removal. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1493 Spurious Opening of Atmospheric Vent Valves

Fire damage to cables could result in the spurious opening of the main steam line atmospheric vent valves. This may cause loss of TD AFW Pumps due to loss of steam pressure. This could challenge the NSPC Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1496 Spurious Safety Features Actuation Signal (SFAS)

Fire damage to cables for the RCS Pressure signal, Containment Pressure signal and/or the Logic Panel could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1523 Operator Monitors CC Pump NPSH

Fire damage could result in loss of indication of level in the CC Surge Tank. Loss of level could lead to loss of CC Pump which provides CCW to multiple systems for cooling. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1526 Command and Control in Control Room / Function Available at ASP

With a fire in this fire compartment, it may be possible for Command and Control to remain in the Main Control Room. Due to loss of control and indications from the Main Control Room, it may be determined that using the Alternate Shutdown Panel (ASP) to augment what is available in the Main Control Room is required. All actions that are performed at the ASP are considered recovery actions. This is assumed to challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1540 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1573 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1616 Loss of Make-up Capability Due to Loss of Support Equipment

Fire damage to cables could result in a loss of support equipment necessary for proper operation of the Make-Up Pumps. This could potentially result in the loss of ability to make-up the RCS from the MUPS system and pose a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1620 Loss of Control Room Capability to Isolate Seal Water Return

Fire damage to cables for RCP seal return isolation valves could result in the loss of control room capability to isolate RCP seal return to the makeup tank resulting in an increase in demand for RCS makeup from the BWST. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1621 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1660 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1665 Loss of Cold Leg Temperature Indication for Control Room and ASP With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1676 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1684 Loss of RCS Inventory Via the Letdown Flowpath with Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cables of valves in the letdown flow path could result a loss of control room capability to close one of the valves to stop RCS inventory loss. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1765 Loss of RCS Inventory Through High Point Vents

Fire damage to cables for RCS high point vent valves could could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1826 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1828 Loss of Control Room Emergency Ventilation requiring portable HVAC if MCR not evacuated.

Fire could result in cable damage to Control Room HVAC components resulting in a loss of emergency ventilation for the control room and equipment credited to achieve a safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1829 Loss of Ability to Trip the Main Turbine from the Control Room

Fire damage could result in loss of ability to trip the Main Turbine from the Control Room. This could challenge the NSPC for Decay Heat Removal, Inventory and Pressure Control and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1830 Loss of RCS Inventory Through Sample System

Fire damage could result in spurious operation of RC240B. This could result in the loss of RCS inventory. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1831 Loss of Control Room Instruments That Are Not on the ASP

Fire damage could result in loss of ability to monitor certain plant parameters. This could challenge monitoring decay heat removal, inventory and pressure control, and reactivity control. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1832 Spurious Operation of Breaker ABDC1

Fire damage could result in the spurious closing of the C1 bus supply breaker from B bus. This could result in the loss of the vital bus. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1833 Loss of Pressurizer Pressure Control Due to Spurious Operation Auxiliary Spray

Fire damage could result in the spurious operation of the DH Auxiliary Spray to the pressurizer. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1840 Thermal Stresses in Idle Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-2009 AFW feed flow overfeed for non-credited S/G.

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: DF-01 **Davis-Besse**

Fire Compartment Description: No. 2 Electrical Penetration Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-1166, DB-1180, DB-1186, DB-1231, DB-1541, DB-1574, DB-1914, DB-1923
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters if available. Overpressure protection is provided by RC13A and RC13B code safety valves. Local trip of pressurizer heaters Groups 1,2,3,4 and Essential Bank 2 could be required. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Makeup Train 1 with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1166, DB-1180, DB-1186, DB-1231, DB-1268, DB-1270, DB-1353, DB-1421, DB-1472, DB-1479, DB-1487, DB-1541, DB-1574, DB-1640, DB-1688, DB-1770, DB-1914, DB-1923, DB-1927, DB-2012, DB-2025, DB-2026
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. Local alignment of steam supplies and AFW flowpaths.	DB-1166, DB-1180, DB-1186, DB-1231, DB-1318, DB-1421, DB-1541, DB-1574, DB-1914, DB-1923, DB-1927
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Local start of Control Room fan or use of temporary ventilation.	DB-1227, DB-1300
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4-Indicators may fail. Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3	DB-1672, DB-1807

SG Level-LISP9B1 or LISP9B8A-S/G 1-1
SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2-Indicators may fail.
SG Pressure PISP12B
RCS Makeup MUPS-FI6425 and FI6435
CCW Surge Tank Level-LI1402

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
11	Embedded Conduits

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-006	Annular Gap Around a 4" Conduit in Barrier 427-N/428B-S	The annular gap is negligible, and the fire protection for Fire Compartments DF-01 and X-01 is not reduced due to the unrated opening. The gap is too small to be filled with material complying with a tested configuration.
C-FP-013.06-033	Four EVS Ducts in Barrier 427-F/314-C Without Dampers in Place.	Based on the measures in place, low combustible loading in the compartments, and the configuration of the ducts, the four duct openings will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-034	Containment Purge Exhaust Duct in Barrier 427-F/314-C	Based on the defense in depth measures in place, low combustible loading in the compartments, and the exhaust purge pipe configuration, the opening will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-037	Containment Purge Exhaust Duct in Barrier 501-F/427-C	Based on the defense in depth measures in place, low combustible loading in the compartments, and the exhaust purge pipe configuration, the opening will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-041	Four EVS Ducts in Barrier 501-F/427-C	Based on the defense in depth measures in place, low combustible loading in the compartments and the ducts configuration, the four duct openings will not reduce the barrier's fire protection capability to an unacceptable level.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: DF-01 **Davis-Besse**

Number	Subject	Purpose
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-082	2-Inch Conduit Sleeve Penetration 426-N-003/427-S2-039	The evaluation concludes that the barrier effectiveness is not reduced for the non-rated seal configuration. There is limited combustible loading and automatic fire detection in both rooms, along with automatic fire suppression in one room.
C-FP-013.06-088	Gap in Barrier 427-N/428-S1	Fire propagation is not credible in either direction due to automatic suppression in one room as well as detection in both rooms.
C-FP-013.06-091	Cable Tray Penetration 427-F-160/314-C1-100	Based on measures in place and the design of the barrier in relation to the penetration configuration, the barrier's fire protection capability is not reduced to an unacceptable level for the subject fire compartments.
C-FP-013.06-092	Cable Tray Penetration 427-F-162/314-C1-093	Based on measures in place and the design of the barrier in relation to the penetration configuration, the barrier's fire protection capability is not reduced to an unacceptable level for the subject fire compartments.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1166 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1180 AFPT Steam Supply Underfeed to Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1186 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1227 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1231 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Valves and Bypass Valves

Fire damage to control circuits could result in MSIV failure to close and MSIV bypass spurious opening causing excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1268 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1300 Loss of Control Room HVAC

Fire could result in cable damage to C21-1 resulting in a loss of emergency ventilation for the control room and equipment credited to achieve a safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1353 Loss of Pressurizer Heaters for Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1472 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1479 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1487 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1541 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1574 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1640 Challenge To RCP Seals Due To Loss Of Seal Injection And Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1672 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1688 Loss of RCS Inventory from Pressurizer Sample and Vent Valves

Fire damage to cables for Pressurizer sample valves and vent valve could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1770 Loss of RCS Inventory Through High Point Vents

Fire damage to cables for RCS high point vent valves could could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1807 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1914 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1923 Loss of Automatic and Timely Control Room Trip Capability of the Main Turbine

Fire damage could result in loss of ability to trip the Main Turbine from the Control Room. This could challenge the NSPC for Decay Heat Removal, Inventory and Pressure Control and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1927 Spurious Safety Features Actuation Signal (SFAS)

Fire damage to cables for the RCS Pressure signal, Containment Pressure signal and/or the Logic Panel could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

VFDR Number DB-2025 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-2026 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **DG-01** **Davis-Besse**

Fire Compartment Description: No. 1 Electrical Penetration Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC200, High Point Pressurizer Vent, and RC239A, Pressurizer Vent to Quench Tank, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-1930, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignments for AFW flowpaths.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1930 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: DH-01 **Davis-Besse**

Fire Compartment Description: Main Steam Line Areas

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or 2.	DB-1130, DB-1176, DB-1232, DB-1541, DB-1564
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 or 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1 or 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1130, DB-1176, DB-1232, DB-1270, DB-1421, DB-1541, DB-1564, DB-2012, DB-2023
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1, OR Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supply.	DB-1130, DB-1176, DB-1232, DB-1318, DB-1421, DB-1541, DB-1564
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. OR Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NI5874A or NINI2 RCS Hot leg Temp.-TIRC3B5 or TIRC3B6 RCS Cold leg Temp.-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1	None

SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2
SG Pressure-PISP12B or PISP12B2
RCS Makeup MUPS-FI6425 and FI6435-Indicators may fail.
CCW Surge Tank Level-LI1402
Train 2
Nuclear Inst.-NI5875A or NINI1
RCS Hot Leg Temp.-TIRC3A5 or TIRC3A6
RCS Cold Leg Temp.-TIRC4A2 or TIRC4A4
RCS Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LIRC14-4 or LRSRC14
S/G Level-LISP9A1 or LISP9A8A-S/G 1-2
SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1
S/G Pressure-PISP12A or PISP12A1A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
11	Embedded Conduits

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-002	42 Inch Penetration in Barrier 600-F/500-C	The path a fire would be required to take to spread between Rooms 500 and 600 is tortuous and not credible. Therefore, a fire damper is not necessary to be installed between the subject duct opening for fire areas DH and EE.
C-FP-013.06-023	Two Unrated 5 X 8 Pressure Doors - Door 601 in Barrier 603-N/602-S and Door 602 in Barrier 603 N/601 S	Based on the design of the unrated openings and the defense in depth measures in place, the barrier's ability to provide an acceptable level of fire protection is not reduced.
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.

Number	Subject	Purpose
C-FP-013.06-049	Non-Rated Floor Hatch in Barrier 600-F/500-C	Based on the design of the hatch, the defense in depth measures, and the low combustible fuel loading associated with the subject compartments, the fire protection capability of the barrier is acceptable with the non-rated hatch installed.
C-FP-013.06-051	Duct Without Fire Damper In Barrier 601A-E/517-W	This duct does not penetrate any fire barriers and this evaluation is only for exposure fires and not a barrier evaluation. Therefore, this duct opening does not reduce fire protection for the subject compartments to an unacceptable level.
C-FP-013.06-054	Main Steam Line Penetration in Barriers 601A-E & 602-E/517W	The barriers and penetrations are acceptable for the subject compartments due to low combustible loading on both sides and the 20-foot height of the openings above the floor.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1130 Spurious Opening of Atmospheric Vent Valves

Fire damage to cables could result in the spurious opening of the main steam line atmospheric vent valves. This may cause loss of TD AFW Pumps due to loss of steam pressure. This could challenge the NSPC Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1176 AFPT Steam Supply Underfeed to Credited Steam Generator - Only One Steam Generator Is Credited But Depends On Fire Location

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1232 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Valves and Bypass Valves

Fire damage to control circuits could result in MSIV failure to close and MSIV bypass spurious opening causing excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1541 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1564 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT - Only One Steam Generator Is Non-Credited But Depends On Fire Location

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

VFDR Number DB-2023 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: E-01 **Davis-Besse**

Fire Compartment Description: No. 1 Auxiliary Feedwater Pump Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-1167, DB-1187, DB-1538, DB-1539, DB-1925
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1167, DB-1187, DB-1270, DB-1421, DB-1538, DB-1539, DB-1717, DB-1925, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feed Pump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1167, DB-1187, DB-1318, DB-1421, DB-1538, DB-1539, DB-1717, DB-1925
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Level-LISP9B1 or LISP9B8A-Idle SG 1-1-Indicators may fail. SG Pressure-PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local	DB-0988

indicators that require no electrical power

Licensing Actions

Number	Title
03	Fire Door 215 Equivalent Protection

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-024	Two 14 Inch Flood Relief Lines in Barriers 124-N/237-S & 124-N/238-S	The barrier is considered adequate based on low combustible loading, the absence of combustibles near the openings, and the tortuous path a fire would have to traverse.
C-FP-013.06-028	Four AFW Pump Room Ventilation Openings in Barriers 326-F1/237-C and 326-F1/238-C	Curbing is provided where required for flammable liquids, and the room above has suppression, while the rooms below have detection. Exhaust openings are separated from safe shutdown equipment by space and a tortuous path so the fire barrier is acceptable with the openings.
C-FP-013.06-030	Gasket Used on Boot Seal - Penetration Number 238-E-021/237-W-034	The requirements of Generic Letter 86-10, specifically, Enclosure 2, Subsection 3.2.2, stipulate that where exact replication of a tested configuration cannot be achieved, the field installation should meet various criteria. Based on the review of the criteria, the "end use" of the fire barrier would be similar and unchanged from the tested configuration.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1167 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1187 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1538 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1539 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1717 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1925 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Fire Compartment: EE-01 **Davis-Besse**

Fire Compartment Description: Auxiliary Bldg Ventilation Rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-1233, DB-1494, DB-1543, DB-1576, DB-2006, DB-2007
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1233, DB-1243, DB-1260, DB-1270, DB-1411, DB-1421, DB-1494, DB-1543, DB-1576, DB-1656, DB-1871, DB-2006, DB-2007, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Motor Driven Feedwater Pump. Local trip of AFPTs.	DB-1233, DB-1243, DB-1318, DB-1421, DB-1494, DB-1543, DB-1576, DB-1871, DB-1872, DB-2006, DB-2007
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required for LVSGR.	DB-1218, DB-1609
Process Monitoring	Control room Indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2-Indicators may fail. SG Pressure-PISP12B or PISP12B2	DB-1520, DB-1524

RCS Makeup MUPS-FI6425 and FI6435
CCW Surge Tank Level-LI1402-Indicator may fail.

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
11	Embedded Conduits

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-002	42 Inch Penetration in Barrier 600-F/500-C	The path a fire would be required to take to spread between Rooms 500 and 600 is tortuous and not credible. Therefore, a fire damper is not necessary to be installed between the subject duct opening for fire areas DH and EE.
C-FP-013.06-037	Containment Purge Exhaust Duct in Barrier 501-F/427-C	Based on the defense in depth measures in place, low combustible loading in the compartments, and the exhaust purge pipe configuration, the opening will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-039	Containment Supply Duct in Barrier 500-F/303 PC-C	Based on the defense in depth measures in place, low combustible loading in the compartments, and the purge supply duct configuration, the opening will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-041	Four EVS Ducts in Barrier 501-F/427-C	Based on the defense in depth measures in place, low combustible loading in the compartments and the ducts configuration, the four duct openings will not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-049	Non-Rated Floor Hatch in Barrier 600-F/500-C	Based on the design of the hatch, the defense in depth measures, and the low combustible fuel loading associated with the subject compartments, the fire protection capability of the barrier is acceptable with the non-rated hatch installed.

Number	Subject	Purpose
C-FP-013.06-057	1/4 Inch Copper Tube in Barrier 501-F/404-C	The penetration seal is acceptable due to low combustible loading in each area, smoke detectors in both rooms, and no significant combustibles located near the penetration.
C-FP-013.06-085	Non-rated Door 517 in Barrier 501-E/514-W	The redesign of the door makes the door non-rated. Based on the measures in place in the subject compartments, the fire protection capability is not reduced to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-12-034, Rev. 0, "Fire Risk Evaluation of Auxiliary Building Ventilation Rooms (EE-01)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1218 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1233 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Valves and Bypass Valves

Fire damage to control circuits could result in MSIV failure to close and MSIV bypass spurious opening causing excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1243 Loss of All AFW Due to Spurious Steam and Feed Rupture Control System (SFRCS) Signal

Fire damage to cables for "FEED-ONLY-GOOD- GENERATOR (FOGG)" could result in loss of AFW to the credited and non-credited S/Gs. Feed must be restored quickly to the credited S/G. Feed must be restored to regain non-credited S/G level within 6 hours following a S/G dry out condition to prevent failure of S/G tubes due to thermal stress of the tube sheet. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1260 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1411 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1494 Spurious Opening of Atmospheric Vent Valves

Fire damage to cables could result in the spurious opening of the main steam line atmospheric vent valves. This may cause loss of TD AFW Pumps due to loss of steam pressure. This could challenge the NSPC Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1520 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1524 Operator Monitors CC Pump NPSH

Fire damage could result in loss of indication of level in the CC Surge Tank. Loss of level could lead to loss of CC Pump which provides CCW to multiple systems for cooling. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1543 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1576 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1609 Loss of Low Voltage Switchgear HVAC

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1656 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1871 Spurious Safety Features Actuation Signal (SFAS)

Fire damage to cables for the RCS Pressure signal, Containment Pressure signal and/or the Logic Panel could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1872 Loss of All AFW Due to Failure of all Steam Supply Valves

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the SG and/or RCS overcooling. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2006 AFPT Steam Supply Overfeed to Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2007 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: EF-01 **Davis-Besse**

Fire Compartment Description: Emergency Feedwater

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 and 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. And Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. None And Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NI5874A or NINI2 RCS Hot Leg Temp.-TIRC3B5 or TIRC3B6 RCS Cold Leg Temp.-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435	None

CCW Surge Tank Level-LI1402
Train 2
Nuclear Inst.-NI5875A or NINI1
RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6
RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4
Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LIRC14-4 or LRSRC14
SG Level-LISP9A1 or LISP9A8A-SG 1-2
SG Level-LISP9B1 or LISP9B8A-Idle SG 1-1
SG Pressure-PISP12A or PISP12A1A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electricity.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

-None

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"

Fire Suppression Effects on Nuclear Safety Performance Criteria

- None

Open Items and VFDRs:

VFDR Number	DB-1270	Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: F-01 **Davis-Besse**

Fire Compartment Description: No. 2 Auxiliary Feedwater Pump Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-0965, DB-0994, DB-1188, DB-1531, DB-1914
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0965, DB-0991, DB-0994, DB-1188, DB-1205, DB-1270, DB-1421, DB-1531, DB-1718, DB-1914, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. Local alignment of steam supplies and AFW flowpath.	DB-0965, DB-0994, DB-1188, DB-1318, DB-1421, DB-1531, DB-1718, DB-1914
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A Idle S/G 1-2-Indicator at ASP. SG Pressure- PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402	None

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
03	Fire Door 215 Equivalent Protection

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-024	Two 14 Inch Flood Relief Lines in Barriers 124-N/237-S & 124-N/238-S	The barrier is considered adequate based on low combustible loading, the absence of combustibles near the openings, and the tortuous path a fire would have to traverse.
C-FP-013.06-028	Four AFW Pump Room Ventilation Openings in Barriers 326-F1/237-C and 326-F1/238-C	Curbing is provided where required for flammable liquids, and the room above has suppression, while the rooms below have detection. Exhaust openings are separated from safe shutdown equipment by space and a tortuous path so the fire barrier is acceptable with the openings.
C-FP-013.06-030	Gasket Used on Boot Seal - Penetration Number 238-E-021/237-W-034	The requirements of Generic Letter 86-10, specifically, Enclosure 2, Subsection 3.2.2, stipulate that where exact replication of a tested configuration cannot be achieved, the field installation should meet various criteria. Based on the review of the criteria, the "end use" of the fire barrier would be similar and unchanged from the tested configuration.
C-FP-013.06-090	Non-rated 4-Inch Pipe Penetration 326-F1-055/238-C-031	Based on the measures in place and the low combustible loading in the subject fire compartments, the non-rated penetration does not reduce the fire barrier to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0965 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0991 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-0994 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1188 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1205 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1531 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1718 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1914 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and

associated auxiliaries.

Fire Compartment: FF-01 **Davis-Besse**

Fire Compartment Description: Control Room Complex

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-1161, DB-1168, DB-1181, DB-1189, DB-1238, DB-1405, DB-1407, DB-1495, DB-1545, DB-1578, DB-1614, DB-1831, DB-2009
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. Local trip of pressurizer heaters Groups 1,2,3,4 and Essential Bank 2 could be required. RCS inventory is maintained by local isolation of letdown and RCP seal return. Makeup is provided by local alignment Makeup Train 1 with suction from the BWST. Local alignment of Seal injection, Letdown and CCW Train 1. Local trip of both trains of makeup pumps, HPI pumps, and CS pumps. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1161, DB-1168, DB-1181, DB-1189, DB-1200, DB-1206, DB-1238, DB-1244, DB-1262, DB-1275, DB-1354, DB-1386, DB-1391, DB-1397, DB-1400, DB-1405, DB-1407, DB-1420, DB-1421, DB-1462, DB-1480, DB-1495, DB-1497, DB-1527, DB-1545, DB-1578, DB-1614, DB-1622, DB-1677, DB-1685, DB-1766, DB-1826, DB-1829, DB-1830, DB-1831, DB-1833, DB-1840, DB-2009, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. Local alignment of steam supplies and AFW flowpaths.	DB-1161, DB-1168, DB-1181, DB-1189, DB-1200, DB-1238, DB-1244, DB-1318,

		DB-1405, DB-1407, DB-1421, DB-1495, DB-1497, DB-1527, DB-1545, DB-1578, DB-1826, DB-1829, DB-1830, DB-1831, DB-2009
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW and AFW pump rooms. Control room evacuations and local operation of components could be required.	DB-1208, DB-1221, DB-1230, DB-1247, DB-1294, DB-1304, DB-1307, DB-1492, DB-1828, DB-1832
Process Monitoring	ASP and local indicators are available for: Nuclear Instrumentation-NI5874C-Local Source Range Indicator. RCS Hot Leg Temperature-TERC3B5-Room 303 RCS Cold Leg Temperature-TERC4B3-Room 303-Indicator may fail. Reactor Coolant System Pressure-PI6365B1-ASP Pressurizer Level-LIRC14-1-ASP SG Level-LISP9B3-SG 1-1-ASP SG Level-LISP9A3-SG 1-2-ASP-Idle S/G SG Pressure-PISP12B1-SG 1-1-ASP RCS Makeup MUPS-Use pressurizer level indication CCW Surge Tank Level-LI1402-Indicator may fail. Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	DB-1410, DB-1419, DB-1665, DB-1666

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-010	Two 1/16" Annular Gaps Around 1" Conduit	The annular gaps are negligible, and the fire protection for the fire compartments is not

Number	Subject	Purpose
	in Barrier	reduced due to the unrated openings. The gaps are too small to be filled with material complying with a tested configuration.
C-FP-013.06-017	1 Inch Pipe Sleeve in Barrier 504-E/502-W for Fire Door Release Chain	The opening is a 1-inch sleeve which is unsealed to allow the free movement of the thermal release chain for the rolling fire door in the Control Room kitchen wall. The pipe sleeve must remain open for the chain release to operate.
C-FP-013.06-058	Unrated Door 509 in Barrier 509-E/508-W	Based on the heavy, self-closing design of the door, its electronic monitoring, low combustible loading in the subject compartments, and one of the compartments being continuously manned, the door does not reduce the fire barrier's capability to an unacceptable level.
C-FP-013.06-068 #1	One Hour Barrier in #1 Control Room- Pipe Sleeves and Core Drills	Based on the compartment locations of this one-hour rated fire barrier (Control Room and Control Cabinet Room), the LDF fill of 7-5/8" is acceptable and will not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-068 #2	One Hour Barrier in #2 Control Room- Blockouts	Based on the compartment locations of this one-hour rated fire barrier (Control Room and Control Cabinet Room), the LDF fill of 7-5/8" is acceptable and will not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-068 #3	One Hour Barrier in #3 Control Room-Air Ducts	Dampers are not required in ducts in accordance with NFPA 90A due to a wall rating of less than 2 hours. Combustible loading is low in the compartment and the configuration is therefore acceptable.
C-FP-013.06-068 #4	#4 Control Room Embedded Electrical Boxes	This evaluation addresses embedded electrical boxes in 1-hour rated walls. The remaining solid block will provide substantial fire resistance. Combustible loading is low in the area, and the configuration is therefore acceptable.
C-FP-013.06-068 #5	#5 Control Room Conduits	This evaluation addresses conduits without internal conduit seals penetrating the 1-hour block walls. The subject conduits are either continuous for at least 5 feet on each side or are not exposed to the room. Extensive conduit tests show limited fire progression in 3-hour tests, therefore this configuration is acceptable for a 1-hour rating.
C-FP-013.06-068 #6	#6 Control Room Structural Steel	This evaluation addresses fire proofed structural steel beams which form a part of the barrier. The provided protection would limit heat transfer across the wall barrier during a 1-hour fire and is adequate.
C-FP-013.06-089	Structural Steel Fireproofing - Control Room Complex	Based on measures in place, along with the normally occupied rooms and low combustible loading, the current configuration of fireproofing is adequate for the subject compartments.
C-FP-013.06-112	One Opening in Barrier 517-W/513-E	The redesign of the door makes it a non-rated door, due to the door no longer being accessible for inspections. Based on the measures in place in the subject compartments, the fire protection capability is not reduced to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire

Number	Subject	Purpose
	Embedded Conduit	protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-12-050, Rev. 2, "Fire Risk Evaluation of Control Room Complex (FF-01)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02508, Rev. 16, "Control Room Evacuation"
- DB-OP-02519, Rev. 21, "Serious Control Room Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1161 AFPT Steam Supply Overfeed to Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1168 AFPT Steam Supply Overfeed To Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1181 AFPT Steam Supply Underfeed to Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1189 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1200 AFW Feed Flow Underfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the credited steam generator. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1206 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1208 CC Flow Diverted through Decay Heat Removal Exchanger

Fire damage to cables could affect the ability to isolate non-essential CCW, thereby causing CCW pump runout. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1221 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1230 Control Room Evacuation and Re-Energizing Essential Bus

Fire damage to control and power circuits for the Essential Bus 4.16 KV and 480 V components. Fire damage could prevent the automatic restoration of the Essential Bus. This could challenge the NSPC for Vital Auxilaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1238 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Valves and Bypass Valves

Fire damage to control circuits could result in MSIV failure to close and MSIV bypass spurious opening causing excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1244 Loss of All AFW Due to Spurious Steam and Feed Rupture Control System (SFRCS) Signal

Fire damage to cables for "FEED-ONLY-GOOD- GENERATOR (FOGG)" could result in loss of AFW to the credited and non-credited S/Gs. Feed must be restored quickly to the credited S/G. Feed must be restored to regain non-credited S/G level within 6 hours following a S/G dry out condition to prevent failure of S/G tubes due to thermal stress of the tube sheet. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1247 Loss of Automatic and Timely Control Room Trip Capability of the Main Generator Output Breakers

Fire damage to electrical cables could result in the loss of automatic and control room capability to isolate the main generator from the electrical grid following a turbine trip. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1262 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1275 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1294 Loss of Containment Air Cooling

Fire damage to cables to the containment air cooler fan and/or service water valves could result in a loss of containment atmospheric cooling. This could affect RCS system instrumentation used to achieve and maintain safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1304 Loss of Credited 4160V Bus C1

Fire damage to cables to the credited EDG could prevent the EDG from starting which would require a manual start. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1307 Loss of Credited Bus C1 Due to Cooling Water to EDG

Fire could damage cables to equipment needed to support EDG which could lead to loss of EDG. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1354 Loss of Pressurizer Heaters for Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1386 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1391 Loss of RCS Inventory from PORV

Fire damage to cables could cause spurious operation of PORV. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1397 Loss of RCS Inventory from Pressurizer Sample and Vent Valves

Fire damage to cables for Pressurizer sample valves and vent valve could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1400 Loss of RCS Makeup Capability Due to Lost Amp Meters

Fire damage could result in loss of indication of amps being drawn by motor, thereby allowing runout of make-up pump. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1405 Motor-Driven Feed Pump may Cause Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the credited steam generator This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1407 Motor-Driven Feed Pump may Cause Non-Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1410 Operator Monitors CC Pump NPSH

Fire damage could result in loss of indication of level in the CC Surge Tank. Loss of level could lead to loss of CC Pump which provides CCW to multiple systems for cooling. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1419	Pressurizer Overfill Due to Loss of Letdown

Water damage due to Spurious Containment Spray, fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1420	RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-1462	Pressurizer Overfill Due to Excessive Flow from Non-Credited High Pressure Injection (HPI) Pump Following RCS Depressurization

Fire damage to cables for the high pressure injection pump and high pressure injection line isolation valves could result in pressurizer overfill due to loss of control room capability to stop the pump or close valves when RCS pressure is less than shutoff head of the high pressure injection pump. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1480	Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1492 Service Water Pump Runout Condition and Loss of Adequate CCW Cooling

Fire could damage cables to SW1399 resulting in runout of the operating service water pump and the loss of cooling to the CCW, CREVS and CAC systems. Service Water is required to remove heat from systems required to achieve and maintain RCS inventory and pressure control and decay heat removal. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1495 Spurious Opening of Atmospheric Vent Valves

Fire damage to cables could result in the spurious opening of the main steam line atmospheric vent valves. This may cause loss of TD AFW Pumps due to loss of steam pressure. This could challenge the NSPC Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1497 Spurious Safety Features Actuation Signal (SFAS)

Fire damage to cables for the RCS Pressure signal, Containment Pressure signal and/or the Logic Panel could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1527 Command and Control in Control Room / Function Available at ASP

With a fire in this fire compartment, it may be possible for Command and Control to remain in the Main Control Room. Due to loss of control and indications from the Main Control Room, it may be determined that using the Alternate Shutdown Panel (ASP) to augment what is available in the Main Control Room is required. All actions that are performed at the ASP are considered recovery actions. This is assumed to challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1545 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines.

This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1578 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1614 Loss of Make-up Capability Due to Loss of Support Equipment

Fire damage to cables could result in a loss of support equipment necessary for proper operation of the Make-Up Pumps. This could potentially result in the loss of ability to make-up the RCS from the MUPS system and pose a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1622 Loss of Control Room Capability To Isolate Seal Water Return

Fire damage to cables for RCP seal return isolation valves could result in the loss of control room capability to isolate RCP seal return to the makeup tank resulting in an increase in demand for RCS makeup from the BWST. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1665 Loss of Cold Leg Temperature Indication for Control Room and ASP With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1666 Loss of Cold Leg Temperature for ASP Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1677 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1685 Loss of RCS Inventory Via the Letdown Flowpath with Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cables of valves in the letdown flow path could result a loss of control room capability to close one of the valves to stop RCS inventory loss. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1766 Loss of RCS Inventory Through High Point Vents

Fire damage to cables for RCS high point vent valves could could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1826 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1828 Loss of Control Room Emergency Ventilation requiring portable HVAC if MCR not evacuated.

Fire could result in cable damage to Control Room HVAC components resulting in a loss of emergency ventilation for the control room and equipment credited to achieve a safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1829 Loss of Ability to Trip the Main Turbine from the Control Room

Fire damage could result in loss of ability to trip the Main Turbine from the Control Room. This could challenge the NSPC for Decay Heat Removal, Inventory and Pressure Control and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1830 Loss of RCS Inventory Through Sample System

Fire damage could result in spurious operation of RC240B. This could result in the loss of RCS inventory. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1831 Loss of Control Room Instruments That Are Not on the ASP

Fire damage could result in loss of ability to monitor certain plant parameters. This could challenge monitoring decay heat removal, inventory and pressure control, and reactivity control. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1832 Spurious Operation of Breaker ABDC1

Fire damage could result in the spurious closing of the C1 bus supply breaker from B bus. This could result in the loss of the vital bus. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1833 Loss of Pressurizer Pressure Control Due to Spurious Operation Auxiliary Spray

Fire damage could result in the spurious operation of the DH Auxiliary Spray to the pressurizer. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1840	Thermal Stresses in Idle Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-2009	AFW feed flow overfeed for non-credited S/G.

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: FF-02 **Davis-Besse**

Fire Compartment Description: Control Room Study Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required for the Control Room.	DB-0726, DB-1828
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: FF-02 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-068 #1	One Hour Barrier in #1 Control Room- Pipe Sleeves and Core Drills	Based on the compartment locations of this one-hour rated fire barrier (Control Room and Control Cabinet Room), the LDF fill of 7-5/8" is acceptable and will not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-068 #6	#6 Control Room Structural Steel	This evaluation addresses fire proofed structural steel beams which form a part of the barrier. The provided protection would limit heat transfer across the wall barrier during a 1-hour fire and is adequate.
C-FP-013.06-089	Structural Steel Fireproofing - Control Room Complex	Based on measures in place, along with the normally occupied rooms and low combustible loading, the current configuration of fireproofing is adequate for the subject compartments.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02519, Rev. 21, "Serious Control Room Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay

Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1828 Loss of Control Room Emergency Ventilation requiring portable HVAC if MCR not evacuated.

Fire could result in cable damage to Control Room HVAC components resulting in a loss of emergency ventilation for the control room and equipment credited to achieve a safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: FF-03 **Davis-Besse**

Fire Compartment Description: Control Room Kitchen

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required for the Control Room.	DB-0726, DB-1301, DB-1828
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: FF-03 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-017	1 Inch Pipe Sleeve in Barrier 504-E/502-W for Fire Door Release Chain	The opening is a 1-inch sleeve which is unsealed to allow the free movement of the thermal release chain for the rolling fire door in the Control Room kitchen wall. The pipe sleeve must remain open for the chain release to operate.
C-FP-013.06-068 #1	One Hour Barrier in #1 Control Room- Pipe Sleeves and Core Drills	Based on the compartment locations of this one-hour rated fire barrier (Control Room and Control Cabinet Room), the LDF fill of 7-5/8" is acceptable and will not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-068 #6	#6 Control Room Structural Steel	This evaluation addresses fire proofed structural steel beams which form a part of the barrier. The provided protection would limit heat transfer across the wall barrier during a 1-hour fire and is adequate.
C-FP-013.06-089	Structural Steel Fireproofing - Control Room Complex	Based on measures in place, along with the normally occupied rooms and low combustible loading, the current configuration of fireproofing is adequate for the subject compartments.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02519, Rev. 21, "Serious Control Room Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3480, "Safety Evaluation of Fire Protection Measures at the DBNPS"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1301 Loss of Control Room HVAC

Fire could result in cable damage to Control Room HVAC fire dampers resulting in a loss of emergency ventilation for the control room and equipment credited to achieve a safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1828 Loss of Control Room Emergency Ventilation requiring portable HVAC if MCR not evacuated.

Fire could result in cable damage to Control Room HVAC components resulting in a loss of emergency ventilation for the control room and equipment credited to achieve a safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **G-01** **Davis-Besse**

Fire Compartment Description: CLW Monitoring Tank Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV, and RC11 Block Valve are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2 RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421, DB-1916
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1916 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOV could result in the loss of control room capability to control steam to the auxiliary feed pump turbine. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: G-02 | **Davis-Besse**

Fire Compartment Description: CWMT pump/filter, and Make up Tk Rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-0989, DB-1169, DB-1534
Inventory and Pressure Control	RCS pressure is maintained by local operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV, is operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Local alignment of CCW Train 2, Letdown and Seal injection. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0947, DB-0949, DB-0950, DB-0985, DB-0989, DB-0990, DB-1169, DB-1258, DB-1270, DB-1375, DB-1421, DB-1534, DB-1678, DB-1686, DB-1711, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-0989, DB-1169, DB-1318, DB-1421, DB-1534, DB-1618, DB-1711, DB-1922
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required for LVSGR.	DB-0726, DB-1217
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A- Idle S/G 1-1-Indicators may fail. SG Pressure-PISP12A RCS Makeup Flow-HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403	DB-0988, DB-1667

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-003	48-Inch By 48-Inch Flood and Vent Path Opening in Barrier 235-E/124-W2	The barrier's ability to provide adequate fire separation has not been reduced to an unacceptable level by the opening.
C-FP-013.06-005	Two Annular Gaps Between Pipe and Pipe Sleeve in Barrier 227-N2/236-S1	The barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated openings.
C-FP-013.06-018	Non-rated L-Shaped 280 Sq. Ft. Equipment Hatch in Barrier 313-F/233-C	Based on the design of the subject fire areas and the design of the hatch, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatch.
C-FP-013.06-019	Non-rated 4 Foot X 8 Foot Equipment Hatch in Barrier 304-F/209-C	Based on the defense in depth design of the subject fire compartments and the design of the hatch, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatch.
C-FP-013.06-020	15 Foot 1/2 Inch by 5 Foot 6 Inch Equipment Hatch in Barrier 227-F/113A-C	The evaluation concludes that the ability of the barrier between compartments AB-01 and G-02 is not reduced to an unacceptable level by the non-rated hatch opening.
C-FP-013.06-021	Non-rated Access Hatch in Barrier 312-F/228-C	Based on the design of the hatch and the four (normally installed) 9" thick concrete slabs, the barrier's ability to provide an acceptable level of fire protection for the subject fire areas is not reduced by the non-rated hatch.
C-FP-013.06-022	Equipment Hatch in Barrier 310-F/227-C	The evaluation concludes that the ability of the barrier between compartments G-02 and U-02 is not reduced to an unacceptable level by the non-rated hatch opening.
C-FP-013.06-031	15 Sq. Ft. Blowout Panel - Penetration No. 235-N-010/236-S2-104	The barrier's ability to provide an acceptable level of fire protection for the conditions involved is not reduced by the unrated opening. This conclusion is supported by low combustible loadings in the rooms, the water curtain protecting the non-rated barrier, and detection.

Number	Subject	Purpose
C-FP-013.06-040	Non-rated Equipment Hatches in Barriers 300-F/102-C, 300-F205-C, 300-F/210-C	Based on the design of the subject fire compartments and the design of the hatches, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatches.
C-FP-013.06-055	Temporary Hose in Fire Barrier 241-F/110A-C	The barrier's ability to provide an acceptable level of fire protection is not reduced by the unrated opening, based on defense in depth measures associated with the subject compartments and lack of combustibles near the seal.
C-FP-013.06-059	6 Foot by 5 Foot 6 Inch Equipment Hatch / Ventilation Opening in Barrier	Fire will not propagate due to low combustible loading, fire detection, and cable trays covered with Kaowool fire barriers in one room, and an automatic sprinkler system in the other.
C-FP-013.06-083	Empty 2 Inch Conduit Penetration DNP/117A-C-002	Based on the routing of the conduit through the subject compartments and no combustible loading in the conduit or compartments, the non-rated penetration will not reduce the ability of the barrier to provide an acceptable level of fire protection between the compartments.
C-FP-013.06-093	1/16th Inch Gap in One Penetration in 117-N/232-F	The 1/16th inch gap in one of the penetrations evaluated is negligible and will not reduce the barrier's fire protection capability to an unacceptable level for the subject fire compartments.
C-FP-013.06-114	Internal Seal for Two Inch Diameter Conduit Penetration	Based on measures in place, it is unlikely for the fire to propagate unsuppressed through the 2-inch conduit to the adjacent subject compartments. The barrier fire protection capability is not reduced to an unacceptable level for the subject fire compartments.
C-FP-013.06-119	Non-Rated Opening In Barrier 102-N/209-S Due to FD1101	Non-rated fire damper FD1101 does not reduce the ability of the fire barrier to provide an acceptable level of fire protection for the conditions presented, and is adequate for the hazard.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
FCR 86-0220A Attachment	Fire Damper FD 1101 Evaluation Between Room 102 and 209	Fire Damper 1101 would not decrease the safety of the plant in the event of a fire due to the low combustible fire loadings in both rooms, the circuitous route that a fire would have to take to pose a concern, the HVAC duct having a fire rating of 1-hour, and the presence of detection and suppression in Fire Compartment G-02.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-0947 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0949 Pressurizer Overfill Due to Loss of Letdown

Water damage due to Spurious Containment Spray, fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0950 Loss of Pressurizer Heaters For Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-0985 Loss of Control Room Capability to Isolate Seal Water Return

Fire damage to cables for RCP seal return isolation valves could result in the loss of control room capability to isolate RCP seal return to the makeup tank resulting in an increase in demand for RCS makeup from the BWST. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-0989 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0990 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1169 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1217 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1258 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1375 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1534 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1618 Loss of AFW Due to Loss of Main Steam Supply Valves to Turbine Driven Pumps

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1667	Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1678	RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1686	Loss of RCS Inventory Via the Letdown Flow Path with Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cables of valves in the letdown flow path could result a loss of control room capability to close one of the valves to stop RCS inventory loss. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1711	Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1922	Uncontrolled AFW Flow to the Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section

4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **G-03** **Davis-Besse**

Fire Compartment Description: SFP demin and valve rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV, and RC11 Block Valve are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2 RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow-HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Fire Compartment: G-03 | **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-036	Inaccessible Penetration Seals in Barrier 210-E/102-W	The barrier penetrations are sealed with a minimum of 11 inches of silicone foam. With the combustible loading being extremely low along with no normal personnel access creating transient combustibles, the seals are acceptable.
C-FP-013.06-040	Non-rated Equipment Hatches in Barriers 300-F/102-C, 300-F205-C, 300-F/210-C	Based on the design of the subject fire compartments and the design of the hatches, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatches.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number	DB-0726	Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: HH-01 **Davis-Besse**

Fire Compartment Description: Control Room AC Equipment Room and Elevator No. 2

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-0916
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0916, DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. Local alignment of steam supplies.	DB-0916, DB-1318, DB-1421, DB-1619
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required for the Control Room.	DB-1828
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435	None

Licensing Actions

-None

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: HH-01 **Davis-Besse**

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-023	Two Unrated 5 X 8 Pressure Doors - Door 601 in Barrier 603-N/602-S and Door 602 in Barrier 603 N/601 S	Based on the design of the unrated openings and the defense in depth measures in place, the barrier's ability to provide an acceptable level of fire protection is not reduced.
C-FP-013.06-089	Structural Steel Fireproofing - Control Room Complex	Based on measures in place, along with the normally occupied rooms and low combustible loading, the current configuration of fireproofing is adequate for the subject compartments.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0916 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1619 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1828 Loss of Control Room Emergency Ventilation requiring portable HVAC if MCR not evacuated.

Fire could result in cable damage to Control Room HVAC components resulting in a loss of emergency ventilation for the control room and equipment credited to achieve a safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: II-01 **Davis-Besse**

Fire Compartment Description: Turbine Building

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-1548, DB-1771, DB-1772, DB-1923
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. Local trip of the pressurizer heaters. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle steam generator tube sheet.	DB-1270, DB-1287, DB-1421, DB-1488, DB-1506, DB-1548, DB-1714, DB-1771, DB-1772, DB-1923, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1287, DB-1318, DB-1421, DB-1548, DB-1714, DB-1771, DB-1772, DB-1923, DB-2027
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required in LVSGR.	DB-0726, DB-1248, DB-1762
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-Indicators may fail. SG Pressure-PISP12A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403	None

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
11	Embedded Conduits

Required Fire Protection Features (See LAR Table 4-3 for details)

- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-028	Four AFW Pump Room Ventilation Openings in Barriers 326-F1/237-C and 326-F1/238-C	Curbing is provided where required for flammable liquids, and the room above has suppression, while the rooms below have detection. Exhaust openings are separated from safe shutdown equipment by space and a tortuous path so the fire barrier is acceptable with the openings.
C-FP-013.06-032	Three Non-rated Equipment Hatches in Barrier 431-F/432-C	Based on the defense in depth design of the subject fire compartments and the design of the hatches, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatches.
C-FP-013.06-035	Fire Door 219 and LDF and HDE Seals Barrier 251-N/334-S5	An unrated, self-closing hollow metal door of substantial construction has been installed and is electronically monitored. Blockouts are sealed with silicone foam, which will provide fire resistance. Door and penetration designs are acceptable due to low combustible loading, as well as automatic suppression.
C-FP-013.06-038	Annular Gap Between Wall and Pipe Sleeve in Barrier 334-W/327-E	The annular gap is negligible, and the fire protection for Fire Compartments II-01 and UU-01 is not reduced due to the unrated opening. The gap is too small to be filled with material complying with a tested configuration.
C-FP-013.06-042	Opening in Barrier 517-N/EXT	Based on the location of the opening and the lack of combustibles in close proximity to the opening, not having an installed damper will not reduce the fire protection capability of the barrier to an unacceptable level.
C-FP-013.06-044	Three Openings in Barrier 328-N/326-S	Based on the design of the half-inch thick plates used to replace the subject doors and the measures in place to preclude the ignition and spread of fire, the barrier's fire protection capability is at an acceptable level.
C-FP-013.06-050	6 Blowout Panels In Barrier 314-3/326-W	Based on the design of the blowout panels, the defense in depth measures, and the low

Number	Subject	Purpose
		combustible fuel loading associated with the subject compartments, the fire protection capability of the barrier is acceptable with the non-rated blowout panels installed.
C-FP-013.06-051	Duct Without Fire Damper In Barrier 601A-E/517-W	This duct does not penetrate any fire barriers and this evaluation is only for exposure fires and not a barrier evaluation. Therefore, this duct opening does not reduce fire protection for the subject compartments to an unacceptable level.
C-FP-013.06-054	Main Steam Line Penetration in Barriers 601A-E & 602-E/517W	The barriers and penetrations are acceptable for the subject compartments due to low combustible loading on both sides and the 20-foot height of the openings above the floor.
C-FP-013.06-058	Unrated Door 509 in Barrier 509-E/508-W	Based on the heavy, self-closing design of the door, its electronic monitoring, low combustible loading in the subject compartments, and one of the compartments being continuously manned, the door does not reduce the fire barrier's capability to an unacceptable level.
C-FP-013.06-066	Unrated Seal Design in Penetrations in North Wall of TB 331-N,334-N,431-N/EXT	Due to the lack of significant combustibles and based on the defense in depth design of the subject fire compartments, the unrated seal designs do not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-071	Non-rated 1 1/2 Inch X 1 1/2 Inch Unsealed Instrument Tube Raceway in Barrier	Based on the measures in place and no combustibles near the penetration, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated penetration.
C-FP-013.06-073	4 Inch Reinforced Concrete Slab & 4 Inch LDF Seals in Barrier	Based on the design of the barrier and the measures in place, the barriers fire protection capability is not reduced to an unacceptable level.
C-FP-013.06-075	Penetrations in Barrier 517-F/331-C	A blockout for the Auxiliary Boiler Exhaust Stack has an unsealed annular gap of approximately 2 inches. The subject pipe sleeves and core drills are sealed with foam. The combustible loading is very low and would not challenge the subject seals.
C-FP-013.06-081	36 Inch by 36 Inch Opening with Damper of Unknown Type in Barrier	Based on measures in place and limited combustible loading in the subject compartments, the non-rated penetration does not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-085	Non-rated Door 517 in Barrier 501-E/514-W	The redesign of the door makes the door non-rated. Based on the measures in place in the subject compartments, the fire protection capability is not reduced to an unacceptable level.
C-FP-013.06-090	Non-rated 4-Inch Pipe Penetration 326-F1-055/238-C-031	Based on the measures in place and the low combustible loading in the subject fire compartments, the non-rated penetration does not reduce the fire barrier to an unacceptable level.
C-FP-013.06-112	One Opening in Barrier 517-W/513-E	The redesign of the door makes it a non-rated door, due to the door no longer being accessible for inspections. Based on the measures in place in the subject compartments, the fire protection capability is not reduced to an unacceptable level.

Number	Subject	Purpose
C-FP-013.06-113	Annular Gap Around 3/4-Inch Diameter Conduit in Barrier	The evaluation concludes that the barrier's ability to provide an acceptable level of fire protection for the conditions involved is not reduced by the non-rated opening.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1248 Loss of Automatic and Timely Control Room Trip Capability of the Main Generator Output Breakers

Fire damage to electrical cables could result in the loss of automatic and control room capability to isolate the main generator from the electrical grid following a turbine trip. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1287 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1488 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1506 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1548 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1714 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1762 Loss of Low Voltage Switchgear HVAC

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1771 Motor-Driven Feed Pump May Cause Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the credited steam generator This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1772 Motor-Driven Feed Pump May Cause Non-Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1923 Loss of Automatic and Timely Control Room Trip Capability of the Main Turbine

Fire damage could result in loss of ability to trip the Main Turbine from the Control Room. This could challenge the NSPC for Decay Heat Removal, Inventory and Pressure Control and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

VFDR Number DB-2027 Loss of Condensate Storage Tank (CST) Inventory Through the Demin. Backwash Pump

Cable damage could spuriously start the backwash pump and spuriously open the discharge valves causing loss of Condensate Storage Tank inventory. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: II-02 **Davis-Besse**

Fire Compartment Description: Auxiliary Boiler Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: II-02 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-027	Three Annular Gaps in Barrier 331-N/EXT	Due to the small size of the openings and lack of combustibles on either side of the wall, the openings do not present a hazard to the area or equipment.
C-FP-013.06-066	Unrated Seal Design in Penetrations in North Wall of TB 331-N,334-N,431-N/EXT	Due to the lack of significant combustibles and based on the defense in depth design of the subject fire compartments, the unrated seal designs do not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-071	Non-rated 1 1/2 Inch X 1 1/2 Inch Unsealed Instrument Tube Raceway in Barrier	Based on the measures in place and no combustibles near the penetration, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated penetration.
C-FP-013.06-075	Penetrations in Barrier 517-F/331-C	A blockout for the Auxiliary Boiler Exhaust Stack has an unsealed annular gap of approximately 2 inches. The subject pipe sleeves and core drills are sealed with foam. The combustible loading is very low and would not challenge the subject seals.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: II-03 **Davis-Besse**

Fire Compartment Description: Seal Oil Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: II-03 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: II-04 **Davis-Besse**

Fire Compartment Description: Maintenance High Bay area

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-1923
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-1923, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421, DB-1923
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: II-04 | **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-069	Four Ducts Without Fire Dampers in Barrier 439-F/340A-C	Automatic sprinklers on one side and low fire loading and continuity of the ducts on the other would prevent a fire propagation. The rating of the barrier can therefore be reduced below 2 hours such that dampers are not needed.
C-FP-013.06-072	Heater Recessed in Concrete Block Wall and Two Unrated Penetration Seals Barrier SB3/N/340-S	A room heater is recessed into the wall leaving 1-3/8" of solid block behind the heater. The metal from the heater will shield the thin portion of the block from direct flame exposure. The barrier will provide a rating in excess of the combustible loading, and is adequate.
C-FP-013.06-074	Steel Hatch in Wall Between Room 340A and Room 343	The evaluation concludes that because of the low combustible loadings, absence of combustibles in close proximity to the steel hatch on either side, the heavy construction of the steel hatch, and the automatic sprinkler system in the office, a fire propagating through the hatch is not credible as long as the hatch is closed.
C-FP-013.06-077	Low Density Foam Penetration Seals in 8 Inch Wall, BARRIER 336-N/433A-S	Compartment II-04 is protected by an automatic sprinkler system which will control or suppress a fire originating on that side of the barrier. The opposite side of the penetrations is in a pipe chase that is void of combustibles. The largest fire loading is in II-04, which would be suppressed by the automatic sprinklers and not challenge the foam fill.
C-FP-013.06-086	Non-Rated Openings of Four Pipes / Pipe Sleeves in Barrier 437-F/340A-C	The openings are sealed. One side is protected by an automatic sprinkler system. The barrier's ability to provide an acceptable level of fire protection for the conditions involved is not reduced by the unrated openings.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1923 Loss of Automatic and Timely Control Room Trip Capability of the Main Turbine

Fire damage could result in loss of ability to trip the Main Turbine from the Control Room. This could challenge the NSPC for Decay Heat Removal, Inventory and Pressure Control and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: II-05 **Davis-Besse**

Fire Compartment Description: Oil Drum Storage Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: II-06 **Davis-Besse**

Fire Compartment Description: Condensate Storage Tank Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provide by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-064	Several Penetrations Through Condensate Storage Tank Room Ceiling	The barrier is acceptable due to thickness of the penetration seals and low combustible loading.
C-FP-013.06-076	5 1/2 Inch Thick Reinforced Concrete Barrier in Celing of Room 345	The barrier is 5.5" thick and is capable of a minimum of 1-hour fire resistance. The maximum fire severity on either side of the barrier is less than 1 hour. Therefore, the acceptable level of fire protection is not reduced for the subject compartments.
C-FP-013.06-078	4 1/2 Inch Thick Reinforced Concrete Barriers, SB2-C/242-F and SB2-C/345-F	Based on the design of the barrier and having a 1-hour fire rating, the non-rated penetration will not reduce the barriers fire protection capability to an unacceptable level for the subject compartments.
C-FP-013.06-079	Six Blockouts with Ducts and Dampers	The combustible fuel loading on each side of the barrier was related to an expected fire duration of less than 30 minutes. Based on the design of the barrier, the fire protection capability will not be reduced to an unacceptable level.
C-FP-013.06-081	36 Inch by 36 Inch Opening with Damper of Unknown Type in Barrier	Based on measures in place and limited combustible loading in the subject compartments, the non-rated penetration does not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-094	Wall-to-Ceiling Seal Between Room 345 and Security Rooms 342 AND 434	Based on the type of seal installed, configuration of the wall-to-ceiling joint, and the low combustible loading, there is adequate protection at the wall-to-ceiling interface to preclude the movement of smoke, hot gases, and fire through the barrier.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

Fire Compartment: II-06 **Davis-Besse**

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses lines and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay

Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **II-07** | **Davis-Besse**

Fire Compartment Description: Lube Oil Filter Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: II-08 | **Davis-Besse**

Fire Compartment Description: Turbine Lube Oil Tank Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-032	Three Non-rated Equipment Hatches in Barrier 431-F/432-C	Based on the defense in depth design of the subject fire compartments and the design of the hatches, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatches.
C-FP-013.06-073	4 Inch Reinforced Concrete Slab & 4 Inch LDF Seals in Barrier	Based on the design of the barrier and the measures in place, the barriers fire protection capability is not reduced to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number	DB-1270	Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: II-09 **Davis-Besse**

Fire Compartment Description: Non-Radwaste Supply Air and Exhaust Equipment Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-0726
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: J-01 **Davis-Besse**

Fire Compartment Description: No. 2 Emergency Diesel Generator Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-0900, DB-1190, DB-1550, DB-1581
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0899, DB-0900, DB-0902, DB-0903, DB-1190, DB-1270, DB-1421, DB-1550, DB-1581, DB-1813, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feed Pump 1. Local alignment of steam supplies and AFW flowpaths.	DB-0900, DB-1190, DB-1318, DB-1421, DB-1550, DB-1581, DB-1813
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2-Indicators may fail. SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local	None

indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- 015.050, Rev. 1, Add. 1, "Evaluation of Fire Suppression System Impact"
- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- PFP-AB-319, Rev. 7, "Diesel Generator 1-2 Room - Rooms 319 and 319A"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered.

The evaluation of drainage capabilities in calculation 015.050 determined that the maximum water depth would be limited by the fire brigade opening the outside doors for the compartment, as directed in the pre-fire plan. Therefore, there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0899 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0900 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0902 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0903 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1190 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1550 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1581 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a

separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1813 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **J-02** | **Davis-Besse**

Fire Compartment Description: No. 2 EDG Day Tank Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Fire Compartment: J-02 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: K-01 **Davis-Besse**

Fire Compartment Description: No. 1 Emergency Diesel Generator Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-1538, DB-1539
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-1538, DB-1539, DB-1710, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1318, DB-1421, DB-1538, DB-1539, DB-1710
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required in LVSGR.	DB-1623
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A Idle S/G 1-1-indicators may fail SG Pressure-PISP12A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	DB-0988

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: K-01 — **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-062	10" High Density Elastomer Wall Barrier Seals	Based on the design of a High Density Elastomer (HDE) seal in a wall barrier, an effective seal material depth of 10 inches is an acceptable 3-hour fire seal.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- 015.050, Rev. 1, Add. 1, "Evaluation of Fire Suppression System Impact"
- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- PFP-AB-318, Rev. 7, "Diesel Generator 1-1 Room - Rooms 318 and 318UL"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered.

The evaluation of drainage capabilities in calculation 015.050 determined that the maximum water depth would be limited by the fire brigade opening the outside doors for the compartment, as directed in the pre-fire plan. Therefore, there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1538 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1539 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1623 Loss of Low Voltage Switchgear HVAC

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1710 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: K-02 **Davis-Besse**

Fire Compartment Description: No. 1 EDG Day Tank Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **K-02** **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-062	10" High Density Elastomer Wall Barrier Seals	Based on the design of a High Density Elastomer (HDE) seal in a wall barrier, an effective seal material depth of 10 inches is an acceptable 3-hour fire seal.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: MA-01 **Davis-Besse**

Fire Compartment Description: Manhole MH3001

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or 2.	DB-1529, DB-1565, DB-2003
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 or 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1 or 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-1511, DB-1529, DB-1565, DB-1719, DB-1879, DB-2003, DB-2012
Decay Heat Removal	Steam Generator 1 supplied by Auxiliary Feedpump 1. Local alignment of steam supplies. OR Steam Generator 2 supplied by Auxiliary Feedpump 2. Local alignment of steam supplies.	DB-1318, DB-1421, DB-1529, DB-1565, DB-1719, DB-2003
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. OR Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 RCS Cold leg Temperature-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2-available at ASP SG Pressure-PISP12B or PISP12B2	DB-0988

RCS Makeup MUPS-FI6425 and FI6435
CCW Surge Tank Level-LI1402
Train 2
Nuclear Inst.-NI5875A or NINI1
RCS Hot leg Temp.-TIRC3A6
RCS Cold leg Temp.-TIRC4A2 or TIRC4A4
Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LIRC14-4 or LRSRC14
SG Level-LISP9A1 or LISP9A8A-S/G 1-2
SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-indicators may fail
SG Pressure-PISP12A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
08	Manhole MH 3001 Cable Separation

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the ignition frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown. There are exposed cables in this compartment; however, these cables are complete runs through the compartment, or they are terminated within sealed junction boxes. Cables themselves are not subject to suppression effects, as there is no credible short-term failure mechanism for them.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-1511	Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1529	Excessive Cooldown of RCS from Credited Steam Generator Through AFPT - Only One Steam Generator Is Credited

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1565	Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT - Only One Steam Generator Is Non-Credited But Depends On Fire Location

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1719 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1879 Loss of the Non-Credited Emergency Bus Causing Non-Credited Steam Generator Overfeed

Fire could damage cables on the non-credited emergency bus resulting in loss of the bus. The loss of power prevents remote isolation of the AFW to the non-credited S/G. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2003 AFPT Steam Supply Overfeed to Non-credited S/G

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: MB-01 **Davis-Besse**

Fire Compartment Description: Manhole MH3004

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-0989, DB-1534
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0989, DB-1270, DB-1421, DB-1534, DB-1720, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-0989, DB-1318, DB-1421, DB-1534, DB-1720
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-indication may fail SG Pressure-PISP12A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	DB-0988

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the ignition frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown. There are exposed cables in this compartment; however, these cables are complete runs through the compartment, or they are terminated within sealed junction boxes. Cables themselves are not subject to suppression effects, as there is no credible short-term failure mechanism for them.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-0989 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1534 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1720 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: MC-01 **Davis-Besse**

Fire Compartment Description: Manhole MH3005

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-0989, DB-1534
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0989, DB-1270, DB-1421, DB-1534, DB-1721, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies.	DB-0989, DB-1318, DB-1421, DB-1534, DB-1721
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-1249
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A- Idle S/G 1-1-Indicators may fail. SG Pressure-PISP12A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	DB-0988

Fire Compartment: **MC-01** **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the ignition frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown. There are exposed cables in this compartment; however, these cables are complete runs through the compartment, or they are terminated within sealed junction boxes. Cables themselves are not subject to suppression effects, as there is no credible short-term failure mechanism for them.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-0989 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1249 Loss of Automatic and Timely Control Room Trip Capability of the Main Generator Output Breakers

Fire damage to electrical cables could result in the loss of automatic and control room capability to isolate the main generator from the electrical grid following a turbine trip. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1534 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1721 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: ME-01 **Davis-Besse**

Fire Compartment Description: Manhole MH3041

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the ignition frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown. There are exposed cables in this compartment; however, these cables are complete runs through the compartment, or they are terminated within sealed junction boxes. Cables themselves are not subject to suppression effects, as there is no credible short-term failure mechanism for them.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: MF-01 **Davis-Besse**

Fire Compartment Description: Manhole MH3042

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the ignition frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown. There are exposed cables in this compartment; however, these cables are complete runs through the compartment, or they are terminated within sealed junction boxes. Cables themselves are not subject to suppression effects, as there is no credible short-term failure mechanism for them.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Fire Compartment Description: Junction Box JB30D4

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Fire Compartment: MG-01 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the ignition frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **MH-01** | **Davis-Besse**

Fire Compartment Description: Manhole MH3009

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 and 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1 or 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. And Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. And Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NI5874A or NINI2 RCS Hot leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold leg Temperature-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2	None

RCS Makeup MUPS-FI6425 and FI6435
CCW Surge Tank Level-LI1402
Train 2
Nuclear Inst.-NI5875A or NINI1
RCS Hot leg Temperature-TIRC3A5 or TIRC3A6
RCS Cold leg Temperature-TIRC4A2 or TIRC4A4
RCS Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LIRC14-4 or LRSRC14
SG Level-LISP9A1 or LISP9A8A-SG 1-2
SG Level-LISP9B1 or LISP9B8A-Idle SG 1-1
SG Pressure-PISP12A or PISP12A1A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- None

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-008, Rev. 1, "NFPA 805 Transition Fire PRA Task 6 - Fire Ignition Frequencies"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

This compartment does not have automatic fire suppression systems installed. Therefore, any actuation of the automatic suppression system will not impact fire PRA or safe shutdown. Any suppression activities would be performed manually by the fire brigade.

Using the ignition frequency calculation (C-FP-013.10-008), it can be determined that this compartment does not contain any fixed ignition sources. This calculation does assign failure probabilities to transient fires due to cutting and welding, cable fires due to cutting and welding, general transient fires, self-ignited cable fires, and junction boxes, for most compartments as is standard under the NUREG/CR-6850 methodology. This is based on the proportion of cables in the compartment to the total amount of cables in the plant, in accordance with the standard methodology.

This compartment does not contain any components required for the fire PRA or safe shutdown. There are exposed cables in this compartment; however, these cables are complete runs through the compartment, or they are terminated within sealed junction boxes. Cables themselves are not subject to suppression effects, as there is no credible short-term failure mechanism for them.

The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and fire extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source. Therefore, impacts to equipment due to manual firefighting activities are not expected to result in damage to ancillary equipment.

In summary, the effects of fire suppression in the compartment are negligible.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay

Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: OS **Davis-Besse**

Fire Compartment Description: Outside Areas

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required for LVSGR.	DB-1250, DB-1344, DB-1709, DB-1828
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: OS **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-016	Annular Gap Between Conduit and Wall in Barrier 385-N/300-S	The annular gap is negligible, and the fire protection for the fire compartments is not reduced due to the unrated openings. The gaps are too small to be filled with material complying with a tested configuration
C-FP-013.06-027	Three Annular Gaps in Barrier 331-N/EXT	Due to the small size of the openings and lack of combustibles on either side of the wall, the openings do not present a hazard to the area or equipment.
C-FP-013.06-042	Opening in Barrier 517-N/EXT	Based on the location of the opening and the lack of combustibles in close proximity to the opening, not having an installed damper will not reduce the fire protection capability of the barrier to an unacceptable level.
C-FP-013.06-066	Unrated Seal Design in Penetrations in North Wall of TB 331-N,334-N,431-N/EXT	Due to the lack of significant combustibles and based on the defense in depth design of the subject fire compartments, the unrated seal designs do not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-120	Duct Without Fire Damper in Barrier 346A-N/301-S	Evaluation assesses fire hazards, suppression, detection, area and combustible loading in each of the subject rooms. The evaluation is determined to be suitable for transition.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- C-FP-013.10-039, Rev. 0, "Detailed Fire Modeling – OS Fire Compartments (OS-01, OS-02, OS-03, OS-04)"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Impacts to equipment due to manual firefighting activities are not expected to result in additional fire damage states. The plant fire brigade is trained to discharge water in a judicious manner and instructed to direct hose streams and portable extinguishers at the base of the fire to limit the amount of overspray beyond the immediate fire source.

Impacts to equipment due to activation of the automatic suppression located in OS-02, Rooms 001 and 002, are beyond the scope of the Detailed Fire Model analysis and are to be treated as an uncertainty.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1250 Loss of Automatic and Timely Control Room Trip Capability of the Main Generator Output Breakers

Fire damage to electrical cables could result in the loss of automatic and control room capability to isolate the main generator from the electrical grid following a turbine trip. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1344 Loss of Low Voltage Switchgear HVAC (E1)

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1709 Loss of Low Voltage Switchgear HVAC (F1)

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1828 Loss of Control Room Emergency Ventilation requiring portable HVAC if MCR not evacuated.

Fire could result in cable damage to Control Room HVAC components resulting in a loss of emergency ventilation for the control room and equipment credited to achieve a safe and stable conditions. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: P-01 | **Davis-Besse**

Fire Compartment Description: Maintenance Room 320

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1534
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1421, DB-1534, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies.	DB-1318, DB-1421, DB-1534
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required in LVSGR (E1/F1).	DB-1345
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Level-LISP9B1 or LISP9B8A-Idle SG 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-009	Two Annular Gaps Between Pipe Sleeve and Wall in Barrier	The annular gaps are negligible and the fire protection for fire compartments P-01 and P-02 are not reduced due to the unrated openings. The gaps are too small to be filled with material complying with a tested configuration.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **P-01** — **Davis-Besse**

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1345 Loss of Low Voltage Switchgear HVAC

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1534 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: P-02 **Davis-Besse**

Fire Compartment Description: Charge Room 321

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1775, DB-1776
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV,and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1421, DB-1775, DB-1776, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421, DB-1775, DB-1776
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required in LVSGR (E1/F1).	DB-0726, DB-1346, DB-1755
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Level-LISP9B1 or LISP9B8A-Idle SG 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Fire Compartment: P-02 **Davis-Besse**

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-009	Two Annular Gaps Between Pipe Sleeve and Wall in Barrier	The annular gaps are negligible and the fire protection for fire compartments P-01 and P-02 are not reduced due to the unrated openings. The gaps are too small to be filled with material complying with a tested configuration.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

Fire Compartment: P-02 **Davis-Besse**

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1346 Loss of Low Voltage Switchgear HVAC (F1)

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1755 Loss of Low Voltage Switchgear HVAC (E1)

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1775 Motor-Driven Feed Pump May Cause Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the credited steam generator This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1776 Motor-Driven Feed Pump May Cause Non-Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: P-03 **Davis-Besse**

Fire Compartment Description: Passage to Diesel Generator Rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1777, DB-1778
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC2A, PORV,and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1288, DB-1421, DB-1777, DB-1778, DB-1778, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1288, DB-1318, DB-1421, DB-1777, DB-1778
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required in LVSGR.	DB-0726, DB-1340, DB-1347
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LRSRC14 SG Level-LISP9A8A-S/G 1-2 SG Level-LISP9B8A-Idle S/G 1-1 SG Pressure-PISP12A1A RCS Makeup Flow HPIS-FYIHP3A or FYIHP3B(Use Pressurizer Level) CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local	None

indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-026	Non-rated 5 Foot X 5 Foot Equipment Hatch in Barrier 428-F/322-C	Based on the defense in depth measures in place and no combustibles located directly above or below the hatch, the non-rated hatch does not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-12-035, Rev. 0, "Fire Risk Evaluation of EDG Passageway (P-03)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0726 Performance-based Evaluation of Fire Barriers

Fire barriers are not rated for a portion of this fire compartment. Performance-based methods allowed in NFPA 805 have been used to analyze the existing barriers to ensure the adequacy for hazards in the area. This may challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
The performance-based analysis of fire compartment boundaries was developed and documented within calculation C-FP-013.10-007, Addendum 1. The analysis has concluded that the non-rated portions of the fire barriers either substantially contain the effects of a fire on either side of the barrier, or are adequate compartment boundaries to withstand the fire effects of the potential hazards.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1288 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1340 Loss of Emergency Diesel Generator Fuel Oil Supply

Fire could damage cables for the fuel oil transfer pump. This could result in the loss of the credited EDG. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1347 Loss of Low Voltage Switchgear HVAC

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1777 Motor-Driven Feed Pump May Cause Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the credited steam generator This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1778 Motor-Driven Feed Pump May Cause Non-Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: Q-01 | **Davis-Besse**

Fire Compartment Description: High Voltage Switchgear Room B

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 1 after RCS depressurization.	DB-1171, DB-1192, DB-1408, DB-1556, DB-1584, DB-1773, DB-1914
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Local trip of Essential Bank 2 heaters. RC2A, PORV, and RC11, Block Valve, are operated as required to decrease RCS pressure for use of a High Pressure Injection pump for makeup. Overpressure protection is provided by RC13A and RC13B safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 1 with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. Local CS pump is tripped to maintain BWST inventory. Local trip of Train 2 Makeup Pump. Local trip of Train 2 HPI pump. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1171, DB-1192, DB-1270, DB-1270, DB-1408, DB-1421, DB-1481, DB-1489, DB-1511, DB-1556, DB-1584, DB-1722, DB-1729, DB-1773, DB-1868, DB-1914, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. Local alignment of steam supplies and AFW flowpaths.	DB-1171, DB-1192, DB-1318, DB-1408, DB-1421, DB-1556, DB-1584, DB-1722, DB-1773, DB-1868, DB-1914
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms. Portable ventilation may be required in LVSGR.	DB-1341, DB-1348
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 RCS Cold Leg Temperature-TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3	None

SG Level-LISP9B1 or LISP9B8A-S/G 1-1
SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2-Indicators may fail.
SG Pressure-PISP12B or PISP12B2
RCS Makeup Flow HPIS-FYIHP3C and FYIHP3D
CCW Surge Tank Level-LI1402

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
11	Embedded Conduits

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection
- ERFBS

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-12-036, Rev. 2, "Fire Risk Evaluation of High Voltage Switchgear Room B (Q-01)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: **Q-01** **Davis-Besse**

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1171 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1192 AFW Feed Flow Overfeed For Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1341 Loss of Emergency Diesel Generator Fuel Oil Supply

Fire could damage cables for the fuel oil transfer pump. This could result in the loss of the credited EDG. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1348 Loss of Low Voltage Switchgear HVAC

Fire could damage cables for ventilation controls or close dampers due to fire affects. This could cause credited bus electrical components located in the Low Voltage Switchgear Room to overheat. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1408 Motor-Driven Feed Pump may Cause Non-Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1481 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1489 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1511 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1556 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1584 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1722	Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1729	Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1773	Motor-Driven Feed Pump May Cause Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the credited steam generator This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1868	Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1914	AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: **R-01** **Davis-Besse**

Fire Compartment Description: Auxiliary Shutdown Panel Room and Duct Chase

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. Local trip of Essential Bank 1 of the pressurizer heaters. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1123, DB-1124, DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1241, DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LRSRC14 SG Level-LISP9A8A-S/G 1-2 SG Level-LISP9B8A-Idle S/G 1-1 SG Pressure PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: R-01 **Davis-Besse**

Licensing Actions

Number	Title
11	Embedded Conduits

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection
- ERFBS

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1123 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1124 Loss of Pressurizer Heaters for Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1241 Loss of Additional AFW Water Source to Steam Generators

Fire damage to cables could result in loss of control room capability to open isolation valve for service water supply to AFW. This could challenge NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: S-01 | **Davis-Besse**

Fire Compartment Description: High Voltage Switchgear Room A

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-1005, DB-1009, DB-1193, DB-1557, DB-1585, DB-1774
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. Local trip of Essential Bank 1 of the pressurizer heaters. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. Locally trip CS Pump. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1005, DB-1006, DB-1007, DB-1009, DB-1193, DB-1220, DB-1270, DB-1421, DB-1557, DB-1585, DB-1723, DB-1774, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1005, DB-1007, DB-1009, DB-1193, DB-1318, DB-1421, DB-1557, DB-1585, DB-1723, DB-1774
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-1004
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-Indicators may fail. SG Pressure-PISP12A RCS Makeup Flow MUPS-FIMU31 or FIMU34	None

CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-97-00218 in Modification 95-0056	Thermo-Lag at Structural Steel Beam Interface-Resolution to Thermo-Lag Fire Barrier Deficiencies	The thermo-lag that is abandoned in place should help to protect the beam and should be left in place. This configuration will not reduce the acceptable level of fire protection for the subject compartments.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-12-025, Rev. 2, "Fire Risk Evaluation of High Voltage Switchgear Room A (S-01)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1004 Loss of Automatic and Timely Control Room Trip Capability of the Main Generator Output Breakers

Fire damage to electrical cables could result in the loss of automatic and control room capability to isolate the main generator from the electrical grid following a turbine trip. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1005 Motor-Driven Feed Pump May Cause Non-Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Reactivity Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1006 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1007 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1009 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1193 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1220 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the

NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1557 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1585 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1723 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1774 Motor-Driven Feed Pump May Cause Credited Steam Generator Overfeed

Fire damage to cables could result in the loss of control room capability to stop the motor driven feed pump after spurious start or to close isolation valves to stop feedwater flow to the credited steam generator This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: T-01 | **Davis-Besse**

Fire Compartment Description: Component Cooling Water Pump Room

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 and 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1 or 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1129, DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1, or Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. OR Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Instrumentation-NI5874A or NINI2 RCS Hot Leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold Leg Temperature-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G-1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435	None

CCW Surge Tank Level-LI1402
Train 2
RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6
RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4
Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LRSRC14
SG Level-LISP9A8A-S/G 1-2
SG Level-LISP9B8A-Idle S/G 1-1
SG Pressure PISP12A1A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indication.

Licensing Actions

Number	Title
02	CCW Pump Separation

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-014	Annular Gap Between a 1 Inch Core Drill and a 3/4 Inch Conduit is Barrier 32B-E-327-W	A fire in one fire area will not propagate to the other based on the caulking on both sides, the small size of the opening, and the low combustible loading in each room.
C-FP-013.06-029	Non-rated Opening Justification for LDF Penetrations in Barrier 421-F/328-C	The barrier's ability to provide an acceptable level of fire protection for the conditions involved is not reduced by the non-rated seal configurations.
C-FP-013.06-044	Three Openings in Barrier 328-N/326-S	Based on the design of the half-inch thick plates used to replace the subject doors and the measures in place to preclude the ignition and spread of fire, the barrier's fire protection capability is at an acceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These

Number	Subject	Purpose
	Structural Steel Fireproofing Design and Protection	rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1129 Challenge to RCP Seals Due to Loss of Seal Cooling

Fire damage of cables to CCW valves to the RCP seal coolers could result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: U-01 **Davis-Besse**

Fire Compartment Description: Spent Fuel Pool Pump Room and Mix Tank area

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1172, DB-1194, DB-1239, DB-1558, DB-1586, DB-1923
Inventory and Pressure Control	RCS pressure is maintained by local operation of Essential Bank 2 of the pressurizer heaters. RC2A,PORV, is operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. RC11, Block Valve, loses power so remains open. Overpressure protection is provided by RC13A and RC13B code safety valves. Local trip of CS Pumps to maintain Borated Water Storage Tank inventory. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Local alignment of CCW Train 2, Letdown and Seal injection, or RCS cooldown to less than 350 degrees Fahrenheit. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1172, DB-1194, DB-1239, DB-1270, DB-1291, DB-1299, DB-1355, DB-1375, DB-1387, DB-1421, DB-1474, DB-1482, DB-1512, DB-1558, DB-1586, DB-1723, DB-1767, DB-1923, DB-1930, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of AFW flowpaths.	DB-1172, DB-1194, DB-1239, DB-1291, DB-1318, DB-1421, DB-1558, DB-1586, DB-1723, DB-1922, DB-1923
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-1251, DB-1490
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 -S/G 1-2	None

SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-may lose instrumentation
SG Pressure-PISP12A
RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-012	Annular Gap Between Pipe Sleeve & 18 Inch MFW Line in Barrier 304-E2/ 310-W2	The evaluation concludes that the barrier's ability to provide an acceptable level of protection is not reduced by the unrated opening because detection and suppression are installed on both sides of the barrier.
C-FP-013.06-013	Two Annular Gaps around 2-Inch Pipes in Barrier 304-E2/310-W1	A fire in one fire area will not propagate to the other based on the partial seal, the small size of the annular gap, and the low combustible loading in each room.
C-FP-013.06-018	Non-rated L-Shaped 280 Sq. Ft. Equipment Hatch in Barrier 313-F/233-C	Based on the design of the subject fire areas and the design of the hatch, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatch.
C-FP-013.06-021	Non-rated Access Hatch in Barrier 312-F/228-C	Based on the design of the hatch and the four (normally installed) 9" thick concrete slabs, the barrier's ability to provide an acceptable level of fire protection for the subject fire areas is not reduced by the non-rated hatch.
C-FP-013.06-022	Equipment Hatch in Barrier 310-F/227-C	The evaluation concludes that the ability of the barrier between compartments G-02 and U-02 is not reduced to an unacceptable level by the non-rated hatch opening.
C-FP-013.06-084	5 Inch Core Drill Penetration 412/412A-F-011/310-C-119	Based on the measures in place and the low combustible fuel loading equating to a fire duration of less than 10 minutes, the subject barrier is not reduced to an unacceptable level due to the non-rated penetration.
C-FP-013.06-095	Penetration 304-E2-102/310-W1-103	The design of the penetration seal will be sufficient to preclude the movement of fire, smoke, and hot gases in the subject fire compartments. Therefore, the barrier's fire protection

Number	Subject	Purpose
		capability is not reduced to an unacceptable level.
C-FP-013.06-120	Duct Without Fire Damper in Barrier 346A-N/301-S	Evaluation assesses fire hazards, suppression, detection, area and combustible loading in each of the subject rooms. The evaluation is determined to be suitable for transition.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1172 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1194 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1239 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Bypass Valves

Fire damage to control circuits for MSIV Bypass Valves could result in spurious opening and excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1251 Loss of Automatic and Timely Control Room Trip Capability of the Main Generator Output Breakers

Fire damage to electrical cables could result in the loss of automatic and control room capability to isolate the main generator from the electrical grid following a turbine trip. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1291 Loss of Capability to Trip RCPs from the Control Room While Seal Injection Lost

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1299 Loss of Control Room Capability to Isolate Seal Water Return

Fire damage to cables for RCP seal return isolation valves could result in the loss of control room capability to isolate RCP seal return to the makeup tank resulting in an increase in demand for RCS makeup from the BWST. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1355 Loss of Pressurizer Heaters for Subcooling

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1375 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1387 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1474 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1482 Pressurizer Overfill Due to Makeup Pump Spurious Start or Valves Spuriously Opening

Fire damage to cables could result in a spurious start of the makeup pump and/or spurious operation of the makeup flow path isolation valves. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1490 Service Water Pump Loss of Minimum Flow and Loss of CCW Cooling

Fire could damage cables to SW1434 resulting in loss of minimum flow of the operating service water pump. This could cause damage to the operating service water pump and loss of flow to the Train 2 CCW Exchanger. This could cause loss of cooling to CCW. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1512 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1558 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1586 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1723 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1767 Loss of RCS Inventory Through High Point Vents

Fire damage to cables for RCS high point vent valves could could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1922 Uncontrolled AFW Flow to the Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat

Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1923 Loss of Automatic and Timely Control Room Trip Capability of the Main Turbine

Fire damage could result in loss of ability to trip the Main Turbine from the Control Room. This could challenge the NSPC for Decay Heat Removal, Inventory and Pressure Control and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1930 AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: UU-01 **Davis-Besse**

Fire Compartment Description: Auxiliary and Turbine Bldg Stairwell and Elevator Rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the control room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-1538, DB-1539
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS Inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. Local trip of CS Pumps to maintain Borated Water Storage Tank inventory. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-1538, DB-1539, DB-1724, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1318, DB-1421, DB-1538, DB-1539, DB-1724
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-Indicators may fail. SG Pressure-PISP12A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local	DB-0988

indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-010	Two 1/16" Annular Gaps Around 1" Conduit in Barrier	The annular gaps are negligible, and the fire protection for the fire compartments is not reduced due to the unrated openings. The gaps are too small to be filled with material complying with a tested configuration.
C-FP-013.06-014	Annular Gap Between a 1 Inch Core Drill and a 3/4 Inch Conduit is Barrier 32B-E-327-W	A fire in one fire area will not propagate to the other based on the caulking on both sides, the small size of the opening, and the low combustible loading in each room.
C-FP-013.06-038	Annular Gap Between Wall and Pipe Sleeve in Barrier 334-W/327-E	The annular gap is negligible, and the fire protection for Fire Compartments II-01 and UU-01 is not reduced due to the unrated opening. The gap is too small to be filled with material complying with a tested configuration.
C-FP-013.06-087	Gap in Wall / Ceiling 421-E/AB-1W	Based on the measures in place and low combustible loading in the subject compartments, the non-rated gap does not reduce the fire barrier's fire protection capability to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: UU-01 **Davis-Besse**

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1538 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1539 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1724 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria

Fire Area Transition Report

Fire Compartment: V-01 **Davis-Besse**

Fire Compartment Description: Spent Fuel Pool Area

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using High Pressure Injection Train 2 after RCS depressurization.	DB-1240, DB-1534, DB-1588, DB-1918
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. RC200,High Point Pressurizer Vent Valve, and RC239A,Pressurizer Vent Valve to Quench Tank, are operated as required to decrease RCS pressure for use of a High Pressure Injection Pump for makeup. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by High Pressure Injection Train 2 with suction from the BWST. Local alignment of CCW Train 2, Letdown and Seal injection or RCS cooldown to less than 350 deg F. Local trip of Makeup Train 1 to stop pressurizer increase. Local trip of CS Pumps to maintain Borated Water Storage Tank inventory. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1120, DB-1240, DB-1258, DB-1268, DB-1270, DB-1375, DB-1388, DB-1421, DB-1475, DB-1534, DB-1588, DB-1671, DB-1724, DB-1768, DB-1899, DB-1918, DB-1919, DB-1920, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-1120, DB-1240, DB-1318, DB-1421, DB-1534, DB-1588, DB-1724, DB-1918, DB-1920
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-1217, DB-1227, DB-1252
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temp.-TIRC3A6 RCS Cold Leg Temp.-TIRC4A2-indication may fail RCS Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-Indicators may fail.	DB-0988, DB-1521

SG Pressure-PISP12A
RCS Makeup Flow HPIS-FYIHP3A and FYIHP3B
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures and flow.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Water-Based Suppression
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-007	Two Annular Gaps Around Conduits in Barrier 404-E/411-W1	The annular gaps are negligible, and the fire protection for Fire Compartments V-01 and CC-01 is not reduced due to the unrated openings. The gaps are too small to be filled with material complying with a tested configuration.
C-FP-013.06-012	Annular Gap Between Pipe Sleeve & 18 Inch MFW Line in Barrier 304-E2/ 310-W2	The evaluation concludes that the barrier's ability to provide an acceptable level of protection is not reduced by the unrated opening because detection and suppression are installed on both sides of the barrier.
C-FP-013.06-013	Two Annular Gaps around 2-Inch Pipes in Barrier 304-E2/310-W1	A fire in one fire area will not propagate to the other based on the partial seal, the small size of the annular gap, and the low combustible loading in each room.
C-FP-013.06-016	Annular Gap Between Conduit and Wall in Barrier 385-N/300-S	The annular gap is negligible, and the fire protection for the fire compartments is not reduced due to the unrated openings. The gaps are too small to be filled with material complying with a tested configuration
C-FP-013.06-019	Non-rated 4 Foot X 8 Foot Equipment Hatch in Barrier 304-F/209-C	Based on the defense in depth design of the subject fire compartments and the design of the hatch, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatch.
C-FP-013.06-040	Non-rated Equipment Hatches in Barriers 300-F/102-C, 300-F205-C, 300-F/210-C	Based on the design of the subject fire compartments and the design of the hatches, the barrier's ability to provide an acceptable level of fire protection is not reduced by the non-rated hatches.
C-FP-013.06-047	Shield Building and Its Penetrations	Based on the design of the shield building and penetration seals, along with the control of combustible loading and defense in depth measures applied, the shield building and

Number	Subject	Purpose
		penetrations provide adequate fire protection for subject compartments.
C-FP-013.06-057	1/4 Inch Copper Tube in Barrier 501-F/404-C	The penetration seal is acceptable due to low combustible loading in each area, smoke detectors in both rooms, and no significant combustibles located near the penetration.
C-FP-013.06-067	1 Inch Unsealed Pipe Sleeve in Barrier 385-N/300-S	Based on the design of the thermal release chain for the rolling fire door in barrier 385-N/300-S2, it is not feasible to seal the opening. There are no significant combustibles in the compartment and there is not a credible path for fire to propagate.
C-FP-013.06-095	Penetration 304-E2-102/310-W1-103	The design of the penetration seal will be sufficient to preclude the movement of fire, smoke, and hot gases in the subject fire compartments. Therefore, the barrier's fire protection capability is not reduced to an unacceptable level.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-97-00218 in Modification 95-0056	Thermo-Lag at Structural Steel Beam Interface-Resolution to Thermo-Lag Fire Barrier Deficiencies	The thermo-lag that is abandoned in place should help to protect the beam and should be left in place. This configuration will not reduce the acceptable level of fire protection for the subject compartments.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Compartment: V-01 **Davis-Besse**

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0988 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1120 Loss of Capability to Trip RCPs from the Control Room

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1217 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1227 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1240 Excessive Cooldown of RCS from Steam Generator Through Main Steam Isolation Bypass Valves

Fire damage to control circuits for MSIV Bypass Valves could result in spurious opening and excessive RCS cooldown. This could challenge the NSPC for Reactivity Control, Decay Heat Removal, Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1252 Loss of Automatic and Timely Control Room Trip Capability of the Main Generator Output Breakers

Fire damage to electrical cables could result in the loss of automatic and control room capability to isolate the main generator from the electrical grid following a turbine trip. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1258 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1268 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1375 Loss of RCP Seal Injection - High Pressure Injection

Although no components are fire-affected, actions are required to align a seal injection flow path from the High Pressure Injection System to the Makeup and Purification System 's seal injection flow path. This challenges Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1388 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1475 Pressurizer Overfill Due to Loss of Letdown

Fire damage to cables and/or the instrument air system for RCS letdown flow path and CCW to letdown cooler flow path isolation valves could result in loss of RCS letdown and pressurizer overfill condition. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1521 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1534 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1588 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1671 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1724 Spurious SFAS Signal Due to Battery Depletion

Fire damage to cables could result in a loss of power to the SFAS Logic Panels upon battery depletion and could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1768	Loss of RCS Inventory Through High Point Vents

Fire damage to cables for RCS high point vent valves could could cause valves to spuriously open. This could challenge NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1899	Pressurizer Overfill Due To Makeup Pump Spurious Start

Fire damage to cables could result in a spurious start of the makeup pump. This could potentially result in the overfill of the pressurizer and challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1918	AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1919	AFW Underfeed Could Lead to Steam Generator Dryout and Tubing Thermal Stress Non-Credited Steam Generator - Only One Steam Generator May Experience Thermal Stress

Fire damage to cables could result in the loss of control room capability to open isolation valves to provide AFW to the non-credited steam generator. This could result in tubing thermal stress to the idle S/G. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1920	Spurious Safety Features Actuation Signal (SFAS)

Fire damage to cables for the RCS Pressure signal, Containment Pressure signal and/or the Logic Panel could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: VA-01 **Davis-Besse**

Fire Compartment Description: Aux. Building Stairwell AB-3A

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1 or 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 and 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 or 2 via the Alternate and Normal Injection lines with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1 or 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. And Steam Generator 2 is supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. And Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Train 1 Nuclear Inst.-NI5874A or NINI2 RCS Hot leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold leg Temperature-TIRC4B2 or TIRC4B4 Reactor Coolant System Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-SG 1-1 SG Level-LISP9A1 or LISP9A8A-Idle SG 1-2 SG Pressure-PISP12B or PISP12B2	None

RCS Makeup MUPS-FI6425 and FI6435
CCW Surge Tank Level-LI1402
Train 2
Nuclear Inst.-NI5875A or NINI1
RCS Hot Leg Temperature-TIRC3A5 or TIRC3A6
RCS Cold Leg Temperature-TIRC4A2 or TIRC4A4
RCS Pressure-PIRC2A3 or PIRC2A4
Pressurizer Level-LIRC14-4 or LRSRC14
S/G Level-LISP9A1 or LISP9A8A-S/G 1-2
S/G Level-LISP9B1 or LISP9B8A-Idle S/G 1-1
S/G Pressure-PISP12A or PISP12A1A
RCS Makeup Flow MUPS-FIMU31 or FIMU34
CCW Surge Tank Level-LI1403

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- None

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: VA-01 **Davis-Besse**

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The expected number of hoses, lines, and design discharge of fixed fire suppressions was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay

Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: X-01 **Davis-Besse**

Fire Compartment Description: Low Voltage Switchgear-F bus and No. 1 Electrical Isolation Rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	DB-0938, DB-1196, DB-1561, DB-1589, DB-1914
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. Local trip of the pressurizer heaters. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 1 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 1. Local CS pump trip to maintain BWST inventory. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0930, DB-0932, DB-0935, DB-0936, DB-0938, DB-1039, DB-1196, DB-1268, DB-1270, DB-1421, DB-1561, DB-1589, DB-1673, DB-1911, DB-1914, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1. Local alignment of steam supplies and AFW flowpaths.	DB-0935, DB-0938, DB-1196, DB-1318, DB-1421, DB-1561, DB-1589, DB-1911, DB-1914
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-1227, DB-2010
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot leg Temperature-TIRC3B5 RCS Cold leg Temperature-TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2-Indicators may fail. SG Pressure-PISP12B RCS Makeup MUPS-FI6425 and FI6435	DB-1412, DB-1672

CCW Surge Tank Level-LI1402-Indicator may fail.

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

Number	Title
11	Embedded Conduits

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-006	Annular Gap Around a 4" Conduit in Barrier 427-N/428B-S	The annular gap is negligible, and the fire protection for Fire Compartments DF-01 and X-01 is not reduced due to the unrated opening. The gap is too small to be filled with material complying with a tested configuration.
C-FP-013.06-026	Non-rated 5 Foot X 5 Foot Equipment Hatch in Barrier 428-F/322-C	Based on the defense in depth measures in place and no combustibles located directly above or below the hatch, the non-rated hatch does not reduce the barrier's fire protection capability to an unacceptable level.
C-FP-013.06-088	Gap in Barrier 427-N/428-S1	Fire propagation is not credible in either direction due to automatic suppression in one room as well as detection in both rooms.
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

Fire Compartment: X-01 **Davis-Besse**

References

- ARS-DB-11-020, Rev. 2, "Fire Risk Evaluation of Low Voltage Switchgear Room F Bus and No. 1 Isolation Room (X-01)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0930 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0932 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0935 Loss of Capability to Trip RCPs from The Control Room When Thermal Barrier Cooling Lost

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0936 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-0938 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1039 Loss of RCS Inventory Via the Cold Leg Sample and Vent Flow Path

Fire could damage cables for valves in the RCS sample/vent flow path. This could result in spurious opening of valves and loss of control room capability to close one of the valves to stop RCS inventory loss. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1196 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1227 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1268 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1412 Operator Monitors CC Pump NPSH

Fire damage could result in loss of indication of level in the CC Surge Tank. Loss of level could lead to loss of CC Pump which provides CCW to multiple systems for cooling. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1561 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1589 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1672 Loss of Cold Leg Temperature Indication With Spurious Containment Spray

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1673 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1911 Spurious Safety Features Actuation Signal (SFAS)

Fire damage to cables for the RCS Pressure signal, Containment Pressure signal and/or the Logic Panel could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1914 AFW Feed Flow Overfeed for Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the credited steam generator. This could result in overcooling of the RCS or overfilling the credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2010 Oil containment systems for Unit Sub Transformers

Install oil containment systems for the Unit Sub transformers located in compartments X-01 and Y-01. These containments to be designed to contain a minimum 10% (23 gal) oil spill.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: X-02 **Davis-Besse**

Fire Compartment Description: Battery Room B

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 1.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 1 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provide by Train 1 via the Alternate Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 1. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 1 is supplied by Auxiliary Feedpump 1.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 1 and SW Train 1. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5874A or NINI2 RCS Hot leg Temperature-TIRC3B5 or TIRC3B6 RCS Cold leg Temperature-TIRC4B2 or TIRC4B4 RCS Pressure-PIRC2B3 or PIRC2B4 Pressurizer Level-LIRC14-3 or LRSRC14 SG Level-LISP9B1 or LISP9B8A-S/G 1-1 SG Level-LISP9A1 or LISP9A8A-Idle S/G 1-2 SG Pressure-PISP12B or PISP12B2 RCS Makeup MUPS-FI6425 and FI6435 CCW Surge Tank Level-LI1402 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Fire Compartment: Y-01 **Davis-Besse**

Fire Compartment Description: Low Voltage Switchgear-E bus and No. 2 Electrical Isolation Rooms

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	DB-1000, DB-1174, DB-1197, DB-1590
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B code safety valves. Local trip of the pressurizer heaters. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by local alignment of CCW Train 2. Local CS pump trip to maintain BWST inventory. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-0997, DB-0998, DB-0999, DB-1000, DB-1174, DB-1197, DB-1258, DB-1270, DB-1366, DB-1421, DB-1590, DB-1674, DB-1917, DB-2012
Decay Heat Removal	Steam Generator 2 is supplied by Auxiliary Feedpump 2. Local alignment of steam supplies and AFW flowpaths.	DB-0998, DB-1000, DB-1174, DB-1197, DB-1318, DB-1421, DB-1590, DB-1917
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	DB-1217, DB-2010
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot Leg Temperature-TIRC3A6 RCS Cold Leg Temperature-TIRC4A2 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-S/G 1-2 SG Level-LISP9B1 or LISP9B8A-Idle S/G 1-1-Indicators may fail. SG Pressure-PISP12A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403	DB-1522

Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Detection
- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.
NPE-98-00081	Overview of Existing Davis-Besse NPS Structural Steel Fireproofing Design and Protection	Most of the presently fireproofed structural steel deviates from approved U.L. designs. These rooms have either been modified to control/eliminate the source of combustibles (e.g., install cable tray covers or room transient combustible limits imposed), or structural steel fireproofing was installed or repaired.

References

- ARS-DB-12-024, Rev. 0, "Fire Risk Evaluation of Low Voltage Switchgear Room E Bus and No. 2 Electrical Isolation Room (Y-01)"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment, which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-0997 RCS Overpressure Due to Spurious Pressurizer Heater Operation

Fire damage to cables could result in the loss of control room capability to operate the pressurizer heaters to maintain RCS pressure and subcooling. Local operation of power supply breaker could be required. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0998 Loss of Capability to Trip RCPs from the Control Room When Thermal Barrier Cooling Lost

Fire damage to cables could result in the loss of control room capability to stop RCPs to prevent RCP seal damage and RCS heat input. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-0999 Thermal Stresses In Non-Credited Steam Generator Due to Loss of Instrumentation

Water damage to the level transmitters due to spurious Containment Spray and/or fire damage to cables for level indication required to restore and maintain non-credited S/G level within 6 hours following a S/G dryout condition. This is to prevent unacceptable thermal stresses on the tubes and potential failure. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1000 Excessive Cooldown of RCS from Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a

separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1174 AFPT Steam Supply Overfeed to Non-Credited Steam Generator

Fire damage to cables for main steam supply isolation MOVs and the AFPT Governor could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in loss of decay heat removal from the RCS via the S/G and/or RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1197 AFW Feed Flow Overfeed for Non-Credited Steam Generator

Fire damage to cables could result in the loss of control room capability to close isolation valves to stop AFW to the non-credited steam generator. This could result in overcooling of the RCS or overfilling the non-credited S/G causing loss of AFPT. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1217 Spurious Containment Spray Pump Actuation with Greater Than 5 Vacuum Breakers Failed

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in potential buckling of the containment vessel when greater than 5 vacuum breakers inoperable. This could challenge the NSPC for Vital Auxiliaries. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1258 Loss of Borated Water Storage Tank (BWST) Inventory Due to Spurious Start of Containment Spray Pump

Fire damage to cables for CS pump and pump discharge valve could result in a loss of control room capability to stop the containment spray pump or close the pump discharge valve. This could result in loss of BWST inventory and/or Cold water shock of the vessel. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1318 Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1366 Challenge to RCP Seals Due to Loss of Seal Injection and Seal Cooling

Fire could damage cables to RCP seal injection makeup flow path valves and CCW valves in the flow path to the RCP seal coolers which would result in a loss of seal cooling and seal failure if RCS temperature remains >350 °F for 8 hours. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1421 Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number DB-1522 Loss of cold leg temperature indication - Spurious containment spray.

Water damage to the temperature elements due to spurious Containment Spray and/or fire damage to cables could result in the loss of cold leg temperature indication. This could challenge the NSPC for Process Monitoring. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number DB-1590 Excessive Cooldown of RCS from Non-Credited Steam Generator Through AFPT

Fire damage to cables for main steam supply isolation MOVs could result in the loss of control room capability to align steam to auxiliary feed pump turbines. This could result in RCS overcooling. This could challenge the NSPC for Inventory and Pressure Control, Decay Heat Removal and Reactivity Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1674 RCS Depressurization Due to Spurious Pressurizer Spray and Spurious Containment Spray

Water damage due to spurious Containment Spray and/or fire damage to cable for RC2 and RC10 could result in the loss of control room capability to stop RCS depressurization. This could challenge the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-1917 Spurious Safety Features Actuation Signal (SFAS)

Fire damage to cables for the RCS Pressure signal, Containment Pressure signal and/or the Logic Panel could cause a spurious actuation of SFAS. This could challenge the NSPC for Inventory and Pressure Control and Decay Heat Removal. This is a separation issue.

Disposition
This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number DB-2010 Oil containment systems for Unit Sub Transformers

Install oil containment systems for the Unit Sub transformers located in compartments X-01 and Y-01. These containments to be designed to contain a minimum 10% (23 gal) oil spill.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR.

VFDR Number DB-2012 Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition
This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

Table B-3 Nuclear Safety Performance Criteria
Fire Area Transition Report

Fire Compartment: Y-02 | **Davis-Besse**

Fire Compartment Description: Battery Room A

Regulatory Basis:

NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Nuclear Safety Performance Criteria	Method of Accomplishment	Comments
Reactivity Control	Trip the reactor from the Control Room. Make up with borated water from the Borated Water Storage Tank using Makeup Train 2.	None
Inventory and Pressure Control	RCS pressure is maintained by operation of Essential Bank 2 of the pressurizer heaters. Overpressure protection is provided by RC13A and RC13B, code safety valves. RCS inventory is maintained by isolation of letdown and RCP seal return. Makeup is provided by Train 2 via the Normal Injection line with suction from the BWST. Thermal Barrier cooling is provided by CCW Train 2. RCS integrity is maintained by diverse means to control the high/low pressure system interface with the RCS and the thermal stress of the RCP seals and idle SG tube sheet.	DB-1270, DB-1421, DB-2012
Decay Heat Removal	Steam Generator 2 supplied by Auxiliary Feedpump 2.	DB-1318, DB-1421
Vital Auxiliaries	Operate CCW Train 2 and SW Train 2. HVAC is credited for MCR, Containment, LVSGR, SW, and AFW pump rooms.	None
Process Monitoring	Control room indicators are available for: Nuclear Instrumentation-NI5875A or NINI1 RCS Hot leg Temperature-TIRC3A5 or TIRC3A6 RCS Cold leg Temperature-TIRC4A2 or TIRC4A4 Reactor Coolant System Pressure-PIRC2A3 or PIRC2A4 Pressurizer Level-LIRC14-4 or LRSRC14 SG Level-LISP9A1 or LISP9A8A-SG 1-2 SG Level-LISP9B1 or LISP9B8A-Idle SG 1-1 SG Pressure-PISP12A or PISP12A1A RCS Makeup Flow MUPS-FIMU31 or FIMU34 CCW Surge Tank Level-LI1403 Diagnostic instrumentation such as pump pressures, flow rates, and temperatures are generally provided by local indicators that require no electrical power.	None

Licensing Actions

-None

Required Fire Protection Features (See LAR Table 4-3 for details)

- Passive Protection

Existing Engineering Equivalency Evaluations (EEEE)

Number	Subject	Purpose
C-FP-013.06-122	One Hour Fire Barrier Rating for Walls with Embedded Conduit	Concrete depth of coverage over embedded conduit is sufficient to provide one hour of fire protection.

References

- ARS-DB-13-061, Rev. 2, "Fire Risk Evaluation for Generic Fire Compartments"
- C-FP-013.10-007, Rev. 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"
- DB-OP-02501, Rev. 24, "Serious Station Fire"
- FHAR, Rev. 26, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Serial No. 1685, "Fire Protection - National Fire Protection Association (NFPA) Code Review, July 31, 1989"
- Serial No. 1735, "Fire Protection - Protection of Equipment Against the Effects of Inadvertent Fire Suppression System Actuation"

Fire Suppression Effects on Nuclear Safety Performance Criteria

Various damage mechanisms such as flooding and exposure to spray were evaluated as documented in Serial No. 1685 and Serial No. 1735. The Fire Protection Association Standard for Waterproofing, Draining of Floors (NFPA 92M) was reviewed for compliance. The review was performed to document the adequacy of the Davis-Besse fire protection features. The expected number of hoses, lines, and design discharge of fixed fire suppression systems was considered. The evaluation of drainage capabilities determined that there is adequate capability to remove the anticipated water from fire suppression activities to prevent immediate damage to equipment which could result in adverse consequences.

Therefore, fire suppression activities are not expected to adversely affect achievement of the nuclear safety performance criteria.

Open Items and VFDRs:

VFDR Number DB-1270 Loss of Borated Water Storage Tank (BWST) Inventory Through the Makeup Pump Recirc Line

Although no components are fire-affected, actions are required to respond to the loss of BWST inventory through the recirc line of the makeup pump. This is a challenge to the NSPC for Inventory and Pressure Control. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with no further action required.

VFDR Number	DB-1318	Loss of Decay Heat Removal Capability Via the Atmospheric Vent Valves (AVVs)

Fire damage could result in the loss of air to the main steam line atmospheric vent valves used to remove decay heat from the RCS. This could challenge the NSPC for decay heat removal. This is a separation issue.

Disposition

This VFDR has been evaluated, and it was determined that the risk, safety margin, and defense in depth meet the acceptance criteria of NFPA 805 Section 4.2.4 with a recovery action credited.

VFDR Number	DB-1421	Overall Plant Risk Reduction - Emergency Feedwater Pump

Fire damage could result in loss of both steam driven auxiliary feedwater pumps and motor-driven feedwater pump. This could challenge the NSPC for Decay Heat Removal. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0195 installs the emergency feedwater tank, the emergency feedwater facility and associated auxiliaries. ECP 13-0196 installs the Diesel-driven Emergency Feedwater Pump and auxiliary equipment.

VFDR Number	DB-2012	Overall Plant Risk Reduction - FLEX Charging Pumps

Fire damage to installed makeup pumps could result in loss of ability to maintain RCS Inventory and Pressure. This could challenge the NSPC for Inventory and Pressure. This is a separation issue.

Disposition

This VFDR will be corrected by plant modifications credited in Attachment S of the LAR. ECP 13-0463 installs additional RCS charging pumps, connections and associated auxiliaries.

D. NEI 04-02 Non-Power Operational Modes Transition

7 Pages Attached

NFPA 805 Section 1.3.1 Nuclear Safety Goal

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

Implementing Guidance F.1 - Review Existing Outage Management Processes

Define Higher Risk Evolutions (HREs), if not already defined in plant outage management procedures. The HRE definition should consider the following:

- Time to boil.
- RCS and fuel pool inventory.
- DHR capability.

Review

NOP-OP-1005, Shutdown Defense in Depth, provides the basic definition of Higher Risk Evolutions used during plant outages as:

“Outage activities or plant conditions during shutdown, which would make the plant more susceptible to an event causing the loss of a Key Shutdown Defense in Depth Evolutions. An example of a shutdown plant condition that is a Higher Risk Evolution would be lowering RCS level to mid-loop when time-to-boil is less than 30 minutes. Shutdown Defense in Depth Contingency Plans should be developed for High Risk Evolutions."

Identification of high-risk evolution is achieved by the use of administrative and operational procedures that have requirements and restriction that ensure acceptable levels of risk and defense in depth are maintained based on reactor coolant system and fuel pool inventory, decay heat removal capability and time to core boil.

Reference Document

NOP-OP-1005, “Shutdown Defense in Depth.”

NFPA 805 Section 1.3.1 Nuclear Safety Goal

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

Implementing Guidance F.2 - Identify Components and Cables

The identification of systems and components to be included in this Non Power Operations (NPO) Review begins with the identification of the plant operational states (POSs) that need to be considered.

Identify the various operational states that a plant goes through during NPO, and which ones are the most risk significant.

Review

ARS-DB-11-003, Revision 3, Non-Power Operational Modes Transition Report. documents the selection of POSs for consideration.

POS 1, SG Heat Removal Available, is the same configuration evaluated by the nuclear safety analysis and no additional review is required for system and component identification.

POS 1, SG Heat Removal Unavailable, and POS 2 at DBNPS were selected for review to identify the NPO system and components required for shutdown high-risk evolutions.

POS 3, Refueling Canal ≥ 23 feet at Davis-Besse, was selected for review to identify any electrical components that could potentially spuriously operate and result in an RCS inventory loss.

The following Key Safety Functions (KSF) defined in NOP-OP-1005 were evaluated against the above POSs for inclusion in the NPO transition review.

- Decay Heat Removal
- Reactor Coolant Inventory Control
- Electrical Power Availability
- Reactivity Control
- Containment Closure
- Spent Fuel Pool Cooling

The evaluation resulted in the exclusion of the Containment Closure and Spent Fuel Pool Cooling KSFs from further consideration. Containment access and closure is administratively controlled with requirements for when and how to establish closure within the necessary time frames. Spent fuel pool cooling time-to-boil calculations identify sufficient time to arrange alternate mitigation strategies to protect the spent fuel.

Alternate strategies include inventory makeup from BWST, Demineralized Water, Fire Water Storage Tank and Lake Erie via Service Water. Manual addition of boron to maintain required concentration is also possible. All other KSFs identified above were explicitly modeled in the NPO Analysis Database (Genesis Solutions Suite, SAFE Module). As documented in ARS-DB-11-003, "Non-Power Operational Modes Transition Report," equipment was selected based on the systems identified for meeting each applicable KSF in NG-DB-00117, "Shutdown Defense in Depth Assessment." The various modes of operation for each system used to satisfy each KSF were reviewed. A comprehensive list of equipment was developed. Where applicable, the NPO-selected equipment's functional requirement was reviewed against the functions previously analyzed for the at-power analysis; and cable selection performed as necessary per applicable project procedures.

The equipment and cables were logically tied and related to the applicable KSF success paths. Power supplies and other supporting components such as interlocks were also identified, listed, and tied with their component and KSF success paths in the analysis database. The selected components were flagged as NPO within the database to allow "pinch point" analysis by fire area.

Reference Document

NG-DB-00117, "Shutdown Defense in Depth Assessment."

ARS-DB-11-003, "Non-Power Operational Modes Transition Report."

NOP-OP-1005, "Shutdown Defense in Depth."

NFPA 805 Section 1.3.1 Nuclear Safety Goal

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

Implementing Guidance F.3 - Perform Fire Area Assessments (Identify pinch points)

Identify locations where:

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

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.

Review

A deterministic fire separation analysis was performed as documented in ARS-DB-11-003 to identify pinch points (i.e., areas where redundant equipment and cables credited for a given KSF fail due to fire damage). A total of 78 fire compartments at Davis-Besse were analyzed.

Thirty-two fire compartments were found to have an adequate number of KSF success paths to survive the entire contents loss of the fire compartment.

Forty-six compartments were found to have pinch points resulting in the potential loss of one or more KSFs success paths.

Reference Document

ARS-DB-11-003, “Non-Power Operational Modes Transition Report.”

NFPA 805 Section 1.3.1 Nuclear Safety Goal

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

Implementing Guidance F.4 - Manage Risks Associated with Fire-induced Vulnerabilities During the Outage.

During those NPO evolutions where risk is relatively low:

The normal fire protection program DID actions are credited for addressing the risk impact of those fires that potentially impact one or more trains of equipment that provide a KSF required during non-power operations, but would not be expected to cause the total loss of that KSF. The following actions 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
    - Transient Fire Hazards
    - Modifications
    - Flammable and Combustible Liquids and Gases
- Compensatory Actions for Fire Protection System Impairments
    - Openings in Fire Barriers
    - Inoperable Fire Detectors or Detection Systems
    - Inoperable Fire Suppression Systems
- Housekeeping

During those NPO evolutions that are defined as HREs:

Additional fire protection DID measures will be taken during HREs by:

- Managing risk in fire areas that contain known pinch points.
- 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. A key element of that process is to ensure that the KSFs perform as needed during the various outage evolutions. During outage planning, the NPO Fire Area Assessment should be reviewed to identify areas of single-point KSF vulnerability during higher risk evolutions to develop any needed contingency plans/actions. For those areas, consider combinations of the following options to reduce fire risk depending upon the significance of the potential damage.

- Prohibition or limitation of hot work in fire areas during periods of increased vulnerability.
- Verification of operable detection and/or suppression in the vulnerable areas.
- Prohibition or limitation of combustible materials in fire areas during periods of increased vulnerability.
- Plant lineup modifications (removing power from equipment once it is placed in its desired position.)
- Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures (such as surveillance cameras) during increased vulnerability.
- Use of recovery actions to mitigate potential losses of key safety functions.
- Identification and monitoring in-situ ignition sources for “fire precursors” (e.g., equipment temperatures.)
- In addition, for KSF Equipment removed from service during the HREs the impact should be evaluated based on KSF equipment status and the NPO Fire Area Assessment to develop needed contingency plans/actions.
- Reschedule the work to a period with lower risk or higher DID.

Review

NOBP-OM-2031, ”Outage Scheduling Process,” considers potential fire concerns, unavailability of fire protection equipment, and fire barriers for important plant equipment during development of an outage schedule to maximize DID for KSFs and establishes compensatory measures and controls as appropriate.

Each fire compartment was analyzed for NPO Modes as documented in ARS Report ARS-DB-11-003. Fire compartments with identified pinch points were evaluated, and plant controls considered that are consistent with FAQ 07-0040 to minimize fire risk. In order to preclude or mitigate the KSF failures in certain fire compartments, enhancements will be developed. These enhancements include planned revisions to the procedures identified above and other plant procedures (e.g., EOPs, etc.), as necessary.

These revisions will incorporate the insights and strategies documented in ARS-DB-11-003 for the plant to reduce fire risk during HREs. The strategies will include but not be limited to the following:

The list of generic recommendations considers the following actions from FAQ 07-0040:

- Prohibition or limitation of hot work in fire areas during periods of increased vulnerability.
- Verification of operable detection and/or suppression in the vulnerable areas.
- Prohibition or limitation of combustible materials in fire areas during periods of increased vulnerability.
- Use of plant configuration changes (e.g., removing power from equipment once it is placed in its desired position).
- Provision of additional fire patrols at periodic intervals or other appropriate compensatory measures (such as surveillance cameras) during increased vulnerability.
- Use of recovery actions to mitigate potential losses of key safety functions.
- Identification and monitoring in situ ignition sources for "fire precursors" (e.g., equipment temperatures).
- Reschedule the work to a period with lower risk or higher DID.

Reference Document

NOBP-OM-2031, "Outage Scheduling Process."

ARS-DB-11-003, "Non-Power Operational Modes Transition Report."

E. NEI 04-02 Radioactive Release Transition

19 Pages Attached

Radioactive Release Analysis

Compartmentation

Fire compartments where radioactive materials are present or expected to be present were screened into the radioactive release review. Certain fire compartments were collectively reviewed since the pre-fire plans may group the fire compartments (e.g., fire zones within a fire compartment, etc.).

Training Review

The fire brigade training materials will include instruction for the containment and monitoring of potentially contaminated fire suppression water and products of combustion.

Pre-Fire Plan Review

Pre-fire Plans:

The pre-fire plans were reviewed for applicability to fixed radiological hazards for each area. The scope of the review included the direct effects of fire suppression activities as directed by fire brigade pre-fire plans and instructions in areas that contain radioactive materials. Those pre-fire plans that address fire areas and compartments where there is no possibility of radiological hazards were screened out from further review. Likewise, fire areas and compartments where radioactive materials are present or expected to be present were screened into the review. During implementation of the LAR, containment and monitoring actions associated with firefighting operations will be included in the specific pre-fire plans for fire areas as appropriate, based on the screening criteria previously identified.

Plant Operating Modes - Applicability:

Since fire suppression activities defined in the pre-fire plans and fire brigade firefighting instructions are written for any plant operating mode, the evaluation was performed without additional consideration for plant operating modes. The pre-fire plans assume the plant is operating at-power in terms of identifying specific hazards; however, the strategies employed do not rely on the operational status of the unit(s) and are therefore valid during outage periods as well.

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
A-01	PFP-AB-102 PFP-AB-104A PFP-AB-109 PFP-AB-109A PFP-AB-111	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-02	PFP-AB-110 PFP-AB-117 PFP-AB-120	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-03	PFP-AB-114	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-04	PFP-AB-115	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-05	PFP-AB-123 PFP-AB-124 PFP-AB-125 PFP-AB-126	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-06	PFP-CB-A236H PFP-CB-A236L	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents. NOTE: Filter Banks located in PAB area (Elevation 768’-7”); Fire Compartment PA-1A.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-07	PFP-AB-236	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-08	PFP-AB-314	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
A-09	PFP-AB-314	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-01	PFP-AB-105 PFP-AB-113	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-02	PFP-CB-A208 PFP-CB-A236H	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-03	PFP-AB-208	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-04	PFP-AB-225	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-05	PFP-AB-303	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-06	PFP-AB-AB3	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AC-01	PFP-YD-PWPT PFP-YD-BWPT	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AD-01	PFP-AB-AB2 PFP-AB-EL3	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
B-01	PFP-AB-101	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
BD-01	PFP-IS-50	N	Screened out	N/A	Not Required
BE-01	PFP-IS-51 PFP-IS-55	N	Screened out	N/A	Not Required
BF-01	PFP-IS-52 PFP-IS-FANS	N	Screened out	N/A	Not Required
BG-01	PFP-IS-53 PFP-TB-250 PFP-TB-251	N	Screened out	N/A	Not Required
BH-01	PFP-WT-11 PFP-WT-12 PFP-WT-12A PFP-WT-13 PFP-WT-15	N	Screened out	N/A	Not Required
BM-01	PFP-DT-PH	N	Screened out	N/A	Not Required
BN-01	PFP-DT-WEEK	N	Screened out	N/A	Not Required
CAF	PFP-CAF-ALL	Y	Pre-fire plan will support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
CC-01	PFP-AB-411CC PFP-AB-412A PFP-AB-414 PFP-AB-418 PFP-AB-421 PFP-AB-422 PFP-AB-422B PFP-AB-424A PFP-AB-425	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
D-01	PFP-CB-214 PFP-CB-215 PFP-CB-216 PFP-CB-218 PFP-CB-220 PFP-CB-315 PFP-CB-316 PFP-CB-317 PFP-CB-410 PFP-CB-EL565 PFP-CB-EL603 PFP-CB-EL653 PFP-CB-PSV1 PFP-CB-RCP1-1 PFP-CB-RCP1-2 PFP-CB-RCP2-1 PFP-CB-RCP2-2	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
DD-01	PFP-AB-422A	N	Screened out	N/A	Not Required
DF-01	PFP-AB-427	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
DG-01	PFP-AB-402	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
DH-01	PFP-AB-601A PFP-AB-601E PFP-AB-601W PFP-AB-602 PFP-AB-705 PFP-AB-706	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
E-01	PFP-AB-237	N	Screened out	N/A	Not Required

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
EE-01	PFP-AB-500 PFP-AB-501 PFP-AB-515	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
EF-01	None	N	Screened out	N/A	Not Required
F-01	PFP-AB-238	N	Screened out	N/A	Not Required
FF-01	PFP-AB-505 PFP-AB-509	N	Screened out	N/A	Not Required
FF-02	PFP-AB-505	N	Screened out	N/A	Not Required
FF-03	PFP-AB-505	N	Screened out	N/A	Not Required
G-01	PFP-AB-200 PFP-AB-201	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
G-02	PFP-AB-205 PFP-AB-209 PFP-AB-221 PFP-AB-227 PFP-AB-228 PFP-AB-230 PFP-AB-231 PFP-AB-232 PFP-AB-233 PFP-AB-234 PFP-AB-235 PFP-AB-240 PFP-AB-241 PFP-AB-242 PFP-AB-243 PFP-AB-244	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
G-03	PFP-AB-210 PFP-AB-211	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
HH-01	PFP-AB-603 PFP-AB-603B	N	Screened out	N/A	Not Required
II-01	PFP-TB-246 PFP-TB-247 PFP-TB-248 PFP-TB-249 PFP-TB-252 PFP-TB-253 PFP-TB-254 PFP-TB-326 PFP-TB-334 PFP-TB-334A PFP-TB-348 PFP-TB-430 PFP-TB-431 PFP-TB-431A PFP-TB-514 PFP-TB-517 PFP-TB-517A PFP-TB-517B PFP-TB-518A PFP-TB-518B PFP-TB-604 PFP-TB-707	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
II-02	PFP-TB-331	N	Screened out	N/A	Not Required
II-03	PFP-TB-333	N	Screened out	N/A	Not Required
II-04	PFP-TB-334 PFP-TB-336 PFP-TB-336C PFP-TB-338 PFP-TB-339 PFP-TB-MAINT	N	Screened out	N/A	Not Required
II-05	PFP-TB-337	N	Screened out	N/A	Not Required

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
II-06	PFP-TB-345	N	Screened out	N/A	Not Required
II-07	PFP-TB-347	N	Screened out	N/A	Not Required
II-08	PFP-TB-432	N	Screened out	N/A	Not Required
II-09	PFP-AB-516	N	Screened out	N/A	Not Required
J-01	PFP-AB-319	N	Screened out	N/A	Not Required
J-02	PFP-AB-320A	N	Screened out	N/A	Not Required
K-01	PFP-AB-318	N	Screened out	N/A	Not Required
K-02	PFP-AB-321A	N	Screened out	N/A	Not Required
LLRW	PFP-LR-385 PFP-LR-386 PFP-LR-387 PFP-LR-388 PFP-LR-389 PFP-LR-390 PFP-LR-391 PFP-LR-392 PFP-LR-394 PFP-LR-395 PFP-LR-397 PFP-LR-398	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
MA-01	PFP-YD-PROT	N	Screened out	N/A	Not Required
MB-01	PFP-YD-PROT	N	Screened out	N/A	Not Required
MC-01	PFP-YD-PROT	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
ME-01	PFP-YD-PROT	N	Screened out	N/A	Not Required
MF-01	PFP-YD-PROT	N	Screened out	N/A	Not Required

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
MG-01	PFP-YD-PROT	N	Screened out	N/A	Not Required
MH-01	PFP-YD-PROT	N	Screened out	N/A	Not Required
NSGSF	PFP-NSGSF-ALL	Y	Pre-fire plan will support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
OF-01	PFP-OB-342 PFP-OB-434 PFP-OB-ENTRY PFP-OB-EL1 PFP-OB-FL2 PFP-OB-FL3 PFP-OB-FL4 PFP-OB-FL5 PFP-OB-SB1 PFP-OB-SB2 PFP-OB-SB3	N	Screened out	N/A	Not Required
OS	PFP-AB-703 PFP-AP-0000 PFP-H2-TLR PFP-PS-FLN2 PFP-RH-0000 PFP-S2-0000 PFP-S6-0000 PFP-SD-30 PFP-SD-31 PFP-YD-CRYO PFP-YD-PROT	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
OSGSF	None	Y	Pre-fire plan will support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
P-01	PFP-AB-320	N	Screened out	N/A	Not Required
P-02	PFP-AB-321	N	Screened out	N/A	Not Required

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
P-03	PFP-AB-322	N	Screened out	N/A	Not Required
Q-01	PFP-AB-323	N	Screened out	N/A	Not Required
R-01	PFP-AB-324	N	Screened out	N/A	Not Required
S-01	PFP-AB-325	N	Screened out	N/A	Not Required
T-01	PFP-AB-328	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
TAB	PFP-TAB-ALL	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
U-01	PFP-AB-310 PFP-AB-312	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
UU-01	PFP-AB-329 PFP-AB-EL2 PFP-AB-AB1	N	Screened out	N/A	Not Required
V-01	PFP-AB-300 PFP-AB-301 PFP-AB-302 PFP-AB-304 PFP-AB-400 PFP-AB-401 PFP-AB-404 PFP-AB-405 PFP-AB-406	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
VA-01	PFP-AB-AB3A	Y	Pre-fire plans support the containment and monitoring of potentially contaminated gaseous and liquid effluents.	Training will reinforce pre-fire plans to address radioactive release goals, objectives, and performance criteria.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
X-01	PFP-AB-428 PFP-AB-428B	N	Screened out	N/A	Not Required

NEI 04-02 Table E-1 Radioactive Release Compartment Review

Compartment	Pre-Fire Plans	Screened In?	Evaluation	Training Review Results	Conclusion
X-02	PFP-AB-428A	N	Screened out	N/A	Not Required
Y-01	PFP-AB-429 PFP-AB-429A	N	Screened out	N/A	Not Required
Y-02	PFP-AB-429B	N	Screened out	N/A	Not Required

Engineered Controls Review

Existing engineering controls, such as use of forced air ventilation and the presence of damming (curbs) for fire suppression agent runoff, were considered during review of pre-fire plans. Because radioactive release review considers impact from the fire suppression activities, consideration was provided where suppression activities could adversely impact the engineering controls. In addition, the engineering controls for addressing plant changes or modifications that could potentially affect the plant fire protection program are maintained through the configuration control processes in place for plant changes.

NEI 04-02 Table E-2 Radioactive Release Transition Engineered Controls Review

			|----------------------------------Engineered Controls----------------------------------|		
Fire Area	RCA?	Screened In?	Liquid Effluents	Gaseous Effluents	Conclusions
A-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-02	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-03	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-04	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-05	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-06	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-07	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.

NEI 04-02 Table E-2 Radioactive Release Transition Engineered Controls Review

Fire Area	RCA?	Screened In?	Liquid Effluents	Gaseous Effluents	Conclusions
			|----------------------------------Engineered Controls	----------------------------------|	
A-08	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
A-09	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-02	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-03	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-04	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-05	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AB-06	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
AC-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.

NEI 04-02 Table E-2 Radioactive Release Transition Engineered Controls Review

Fire Area	RCA?	Screened In?	Liquid Effluents (Engineered Controls)	Gaseous Effluents (Engineered Controls)	Conclusions
AD-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
B-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
BD-01	non-RCA	N	N/A	N/A	Not Required
BE-01	non-RCA	N	N/A	N/A	Not Required
BF-01	non-RCA	N	N/A	N/A	Not Required
BG-01	non-RCA	N	N/A	N/A	Not Required
BH-01	non-RCA	N	N/A	N/A	Not Required
BM-01	non-RCA	N	N/A	N/A	Not Required
BN-01	non-RCA	N	N/A	N/A	Not Required
CAF	RCA	Y	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
CC-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
D-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
DD-01	non-RCA	N	N/A	N/A	Not Required

NEI 04-02 Table E-2 Radioactive Release Transition Engineered Controls Review

Fire Area	RCA?	Screened In?	Liquid Effluents (Engineered Controls)	Gaseous Effluents (Engineered Controls)	Conclusions
DF-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
DG-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
DH-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
E-01	non-RCA	N	N/A	N/A	Not Required
EE-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
EF-01	non-RCA	N	N/A	N/A	Not Required
F-01	non-RCA	N	N/A	N/A	Not Required
FF-01	non-RCA	N	N/A	N/A	Not Required
FF-02	non-RCA	N	N/A	N/A	Not Required
FF-03	non-RCA	N	N/A	N/A	Not Required
G-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
G-02	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
G-03	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.

NEI 04-02 Table E-2 Radioactive Release Transition Engineered Controls Review

Fire Area	RCA?	Screened In?	Liquid Effluents (Engineered Controls)	Gaseous Effluents (Engineered Controls)	Conclusions
HH-01	non-RCA	N	N/A	N/A	Not Required
II-01	RCA	Y	Liquid effluents are routed via drains to settling basins (ponds) which are monitored prior to release. A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
II-02	non-RCA	N	N/A	N/A	Not Required
II-03	non-RCA	N	N/A	N/A	Not Required
II-04	non-RCA	N	N/A	N/A	Not Required
II-05	non-RCA	N	N/A	N/A	Not Required
II-06	non-RCA	N	N/A	N/A	Not Required
II-07	non-RCA	N	N/A	N/A	Not Required
II-08	non-RCA	N	N/A	N/A	Not Required
II-09	non-RCA	N	N/A	N/A	Not Required
J-01	non-RCA	N	N/A	N/A	Not Required
J-02	non-RCA	N	N/A	N/A	Not Required
K-01	non-RCA	N	N/A	N/A	Not Required
K-02	non-RCA	N	N/A	N/A	Not Required
LLRW	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	LLRWSF exhaust air is monitored. High alarms will trip ventilation systems	Satisfies performance requirements of NFPA 805 for Radioactive Release.
MA-01	non-RCA	N	N/A	N/A	Not Required

NEI 04-02 Table E-2 Radioactive Release Transition Engineered Controls Review

Fire Area	RCA?	Screened In?	Engineered Controls: Liquid Effluents	Engineered Controls: Gaseous Effluents	Conclusions
MB-01	non-RCA	N	N/A	N/A	Not Required
MC-01	non-RCA	N	N/A	N/A	Not Required
ME-01	non-RCA	N	N/A	N/A	Not Required
MF-01	non-RCA	N	N/A	N/A	Not Required
MG-01	non-RCA	N	N/A	N/A	Not Required
MH-01	non-RCA	N	N/A	N/A	Not Required
NSGSF	RCA	Y	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
OF-01	non-RCA	N	N/A	N/A	Not Required
OS	RCA	Y	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
OSGSF	RCA	Y	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
P-01	non-RCA	N	N/A	N/A	Not Required
P-02	non-RCA	N	N/A	N/A	Not Required
P-03	non-RCA	N	N/A	N/A	Not Required
Q-01	non-RCA	N	N/A	N/A	Not Required
R-01	non-RCA	N	N/A	N/A	Not Required

NEI 04-02 Table E-2 Radioactive Release Transition Engineered Controls Review

Fire Area	RCA?	Screened In?	Liquid Effluents (Engineered Controls)	Gaseous Effluents (Engineered Controls)	Conclusions
S-01	non-RCA	N	N/A	N/A	Not Required
T-01	RCA	Y	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	Exhaust is to the Turbine Building. A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
TAB	RCA	Y	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR limits.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
U-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
UU-01	non-RCA	N	N/A	N/A	Not Required
V-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
VA-01	RCA	Y	Liquid effluents are routed via drains to holdup waste tanks which are monitored prior to release.	The Emergency Ventilation System may be initiated to direct the exhaust air to the station vent stack.	Satisfies performance requirements of NFPA 805 for Radioactive Release.
X-01	non-RCA	N	N/A	N/A	Not Required
X-02	non-RCA	N	N/A	N/A	Not Required
Y-01	non-RCA	N	N/A	N/A	Not Required
Y-02	non-RCA	N	N/A	N/A	Not Required

Post-LAR Implementation Issue:

The applicable pre-fire plans and applicable training lesson plans will be updated to include guidance for containment and monitoring of potentially contaminated fire suppression water and products of combustion. This guidance will be incorporated into plant specific area pre-fire plans and available for fire brigade use by the scheduled fire protection program implementation date.

A bounding analysis was developed that determined that in the event of a fire the radiological release would not exceed 10 CFR 20 limits.

NFPA 805 Nuclear Safety Performance Criteria:

The Nuclear Safety Performance Criteria require the prevention of fuel cladding damage either deterministically or by providing “reasonable assurance that a fire will not result in a radiological release that adversely affects the public, plant personnel, or the environment” via a measure of CDF and LERF along with defense-in-depth and safety margin considerations. As such, radiological release examination is limited to that radiation release to unrestricted areas due to the direct effects of fire suppression activities and shall be low as reasonably achievable and shall not exceed applicable 10 CFR Part 20 limits.

Area radiation monitoring equipment, radiological control facilities, environmental protection programs, and administrative controls are provided for surveillance, control of radiation, and limiting of exposure levels. These ensure adequate radiation protection for station personnel and the general public in accordance with applicable criteria. The waste disposal systems are designed to process wastes to meet the requirements of 10 CFR 20. The plant programs, fire brigade training and instructions are relied upon to sustain fire brigade performance. Based on the above, radiation release to any unrestricted area due to the direct effects of fire suppression activities (but not involving fuel damage) would be as low as reasonably achievable and would not exceed applicable 10 CFR Part 20 limits.

F. Fire-Induced Multiple Spurious Operations Resolution

6 Pages Attached

As part of the NFPA 805 transition project, a comprehensive review and evaluation of Davis-Besse Nuclear Power Station susceptibility to fire-induced multiple spurious operations (MSOs) was performed. The process was conducted in accordance with NEI 04-02 Revision 1 and Regulatory Guide 1.205 Revision 0, as supplemented by FAQ 07-0038, Revision 3.

Background

NEI 04-02 suggests that a licensee submit a summary of its approach for addressing potential fire-induced multiple spurious operations (MSOs) for NRC review and approval. As a minimum, NEI 04-02 suggest that the summary contain sufficient information relevant to methods, tools, and acceptance criteria used to enable the staff to determine the acceptability of the licensee's methodology. First Energy requests NRC approval of the process described below.

Methodology

The NRC staff has reviewed Revision 1 of NEI 00-01 and concluded that Chapter 3 provides an acceptable deterministic approach for analysis of post-fire safe shutdown circuits when applied in accordance with the regulatory expectations described in RIS 2005-30 and when used in conjunction with NFPA 805 and Regulatory Guide 1.205 for a plant that has transitioned to a 10 CFR 50.48(c) licensing basis (Reference: RIS 2005-30 and Regulatory Guide 1.205 Revision 0). In addition, an acceptable Fire PRA as defined in Regulatory Guide 1.205 Regulatory Position C.4.3 includes methods for the selection of cables and detailed circuit failure modes analysis, as well as the integration of these circuit failures into the overall Fire PRA (e.g., NUREG/CR-6850 Tasks 3, 9, 10, and 14).

The approach outlined in Figure F-1 below is one acceptable method to address fire-induced MSOs. This method uses insights from a Fire PRA that meets the requirements of Regulatory Guide 1.205, Revision 0.

This process is intended to be in support of transition to a new licensing basis. Post-transition changes would use the risk-informed, performance-based change process. The post-transition change process for the assessment of a specific MSO would be a simplified version of this process, and may not need the level of detail shown in the following section (e.g., An expert panel may not be necessary to identify and assess a new potential MSO. Identification of new potential MSOs may be part of the plant change review process and/or inspection process).

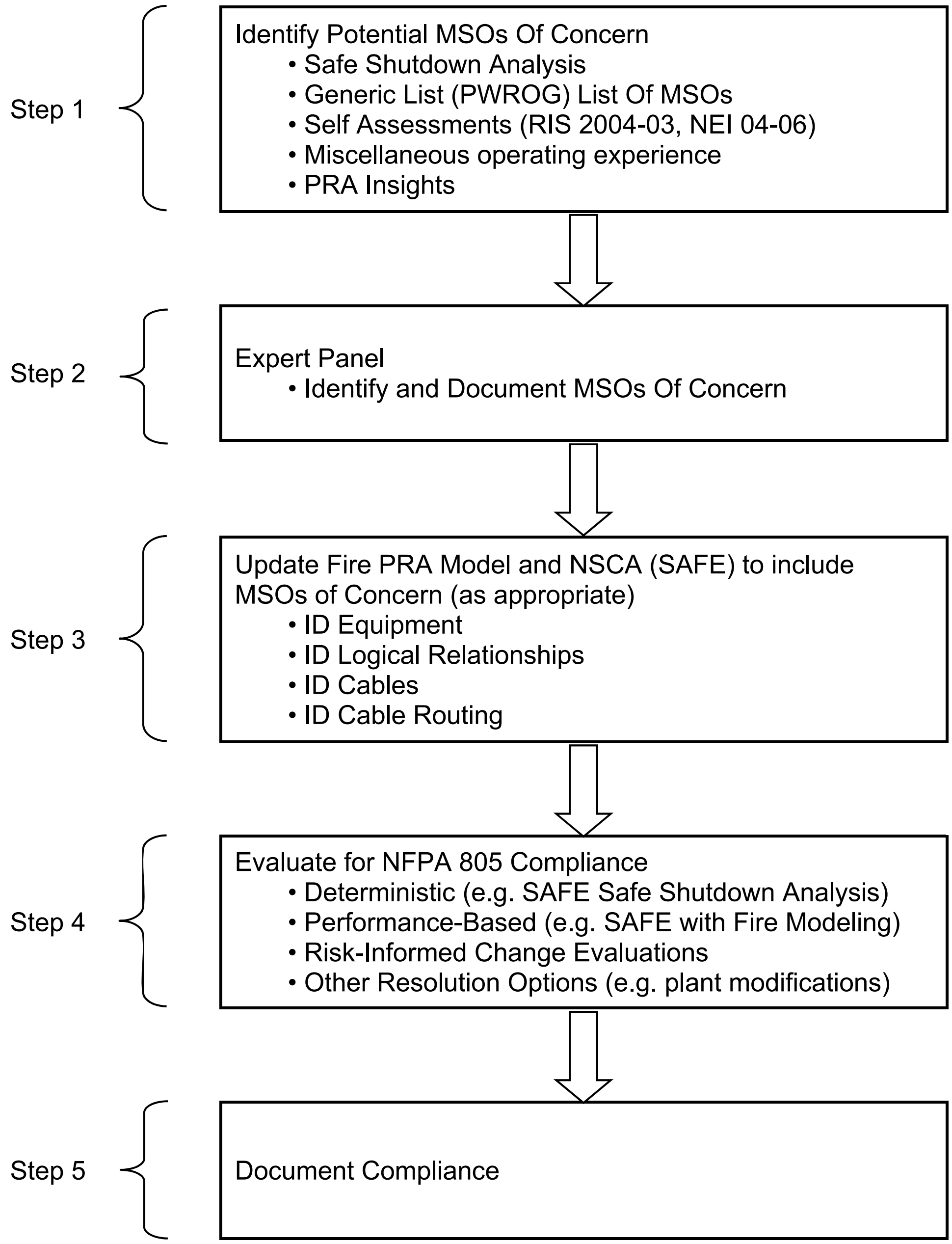

Figure F-1: Multiple Spurious Operations - Transition Resolution Process

Table F-1 – FAQ 07-0038, Revision 3 Summary Table

Guidance (NEI 04-02, FAQ 07-0038)	DBNPS Process/Results
Step 1 Identify potential MSOs of concern Information sources that may be used as input include: • Post-fire safe shutdown analysis (NEI 00-01, Revision 1, Chapter 3) • Generic lists of MSOs (e.g., from Owners Groups and/or later versions of NEI 00-01, if endorsed by NRC for use in assessing MSOs) • Self-assessment results (e.g., NEI 04-06 assessments performed to addressed RIS 2004-03) • PRA insights (e.g., NEI 00-01 Revision 1, Appendix F) • Operating Experience (e.g., licensee event reports, NRC Inspection Findings, etc.)	The MSO identification review process was conducted with an extensive review of plant systems and drawings. The following was used as input to the overall assessment of MSOs at DBNPS: • Post-fire safe shutdown analysis • PWR Owner’s Group (PWROG) generic list of MSOs • Fire PRA Task Plan for Task 2 (Component Selection) • Task 5.2 Fire PRA Component Selection • Self-Assessments (RIS 2004-03, NEI 04-06) • Miscellaneous operating experience • PRA Insights Systems selected for power operations and non-power operations, and components added in the Fire PRA were reviewed.

Table F-1 – FAQ 07-0038, Revision 3 Summary Table

Guidance (NEI 04-02, FAQ 07-0038)	DBNPS Process/Results

Step 2 Conduct an expert panel to assess plant-specific vulnerabilities (e.g., per NEI 00-01, Revision 1, Section F.4.2)
 	
The expert panel should focus on system and component interactions that could impact nuclear safety. This information will be used in later tasks to identify cables and potential locations where vulnerabilities could exist.
 	
The documentation of the results of the expert panel should include how the expert panel was conducted, including the members of the expert panel, their experience, education, and areas of expertise. The documentation should include the list of MSOs reviewed, as well as the source for each MSO. This documentation should provide a list the MSOs that were included in the PRA and a separate list of MSOs that were not kept for further analysis (and the reasons for rejecting these MSOs for further analysis).
 	
Describe the expert panel process (e.g., when it was held, what training was provided to the panel members, what analyses were reviewed to identify MSOs, how was consensus achieved on which MSOs to keep and any dispute resolution process criteria used in decision process, etc.).
 	
[Note: The physical location of the cables of concern (e.g., fire zone/area routing of the identified MSO cables), if known, may be used at this step in the process to focus the scope of the detailed review in further steps.]
	An expert panel was conducted for DBNPS in November of 2008, which followed and amplified the guidance of NEI 00-01, Revision 1, Section F.4.2. The results of this panel were documented in ARS/Scientech Report ARS-DB-11-0005, "Multiple Spurious Operation (MSO) Expert Panel Review Report," including:
	• Identification and qualification of members of the expert panel (i.e., experience, education, and area of expertise)
	• Sources of MSOs that were reviewed
	• Description of the expert panel process
	• Documentation of results (including disposition of potential MSOs)
	• The scenarios for the various MSO functional areas are:
	  ○ RCS Inventory Control / Integrity
	  ○ Decay Heat Removal
	  ○ RCS Pressure Control
	  ○ Reactivity Control
	  ○ Support Functions
	  ○ Other Additional Scenarios
	• NEI-00-01 was revised after the meeting of the Expert Panel, adding a section on identification and treatment of MSOs. A review of this revision determined the Expert Panel meeting still met all requirements for NFPA 805.

Table F-1 – FAQ 07-0038, Revision 3 Summary Table

Guidance (NEI 04-02, FAQ 07-0038)	DBNPS Process/Results
Step 3 – Update the Fire PRA model and NSCA to include the MSOs of concern This includes the following: • Identification of equipment (NUREG/CR-6850, Task 2) • Identification of cables that, if damaged by fire, could result in the spurious operation (NUREG/CR-6850, Task 3, Task 9) • Identify routing of the cables identified above, including associating that routing with fire areas, fire zones, and/or Fire PRA physical analysis units, as applicable. Include the equipment/cables of concern in the Nuclear Safety Capability Assessment (NSCA). Including the equipment and cable information in the NSCA does not necessarily imply that the interaction is possible because separation/protection may exist throughout the plant fire areas such that the interaction is not possible. Note: Instances may exist where conditions associated with MSOs do not require update of the Fire PRA and NSCA analysis. For example, Fire PRA analysis in NUREG/CR-6850, Task 2, Component Selection, may determine that the particular interaction may not lead to core damage, or pre-existing equipment and cable routing information may determine that the particular MSO interaction is not physically possible. In other instances, the update of the PRA may not be warranted if the contribution is negligible. The rationale for exclusion of identified MSOs from the Fire PRA and NSCA should be documented, and the configuration control mechanisms should be reviewed to provide reasonable confidence that the exclusion basis will remain valid.	The results of the Expert Panel are included in Task 5.2 (NUREG/CR-6850, Task 2) of the DBNPS FPRA. Task 5.2 addresses spurious operations, including MSOs, identified in the post-fire safe shutdown analysis. Additional MSOs resulting from the MSO Expert Panel Review Report, ARS-DB-11-0005, were provided as input into the Fire PRA development. The results of the Fire PRA model update are included in Calculation C-FP-013.10-017, which includes the following: • Correlation of SSD components and PRA basic events • Correlation of PRA basic events and SSD components • A listing of MSOs considered with documentation of their disposition The MSO combination components of concern are integrated into the NSCA (i.e., SAFE database) as part of the safe shutdown analysis Boolean logics, as applicable (see action item DB-0671). Integrating MSOs into the SAFE logics allow interactions of spurious actuations to cause failure of system and/or performance goal logics during the analysis (i.e., compliance assessment) step.

Table F-1 – FAQ 07-0038, Revision 3 Summary Table

Guidance (NEI 04-02, FAQ 07-0038)	DBNPS Process/Results
Step 4 – Evaluate for NFPA 805 Compliance The MSO combinations included in the NSCA should be evaluated with respect to compliance with the deterministic requirements of NFPA 805, as discussed in Section 4.2.3 of NFPA 805. For those situations in which the MSO combination does not meet the deterministic requirements of NFPA 805 (VFDR), the issue with the components and associated cables should be mitigated by other means (e.g., performance-based approach per Section 4.2.4 of NFPA 805, plant modification, etc.). The performance-based approach may include the use of feasible and reliable recovery actions. The use of recovery actions to demonstrate the availability of a success path for the nuclear safety performance criteria requires that the additional risk presented by the use of these recovery actions be evaluated (NFPA 805, Section 4.2.4).	The MSO combination components of concern are evaluated as part of the NSCA (i.e., SAFE database). The compliance assessment used both deterministic and performance-based approaches to demonstrate compliance with NFPA 805, using one of the following resolution methodologies in decreasing order of preference: • Compartment initially compliant without resolutions • Pre-transition resolutions, including the use of feasible and reliable recovery actions • Performance-based analysis using the results of fire modeling and/or detailed circuit analysis • Risk-informed, performance-based change evaluations • Other resolutions (e.g., plant modifications) Pre-transition resolutions that relied on the “single spurious” or “any and all, one at a time” bases are not used to demonstrate compliance, as they will not be transitioned to the new licensing basis. Likewise, those pre-transition recovery actions (resolutions) that were deemed unallowable per the pre-transition licensing basis (Bin H for FAQ 06-0012) are not used. The process and results for FREs are summarized in Section 4.5 of the Transition Report.
Step 5 - Document Results The results of the process should be documented. The results should provide a detailed description of the MSO identification, analysis, disposition, and evaluation results (e.g., references used to identify MSOs; the composition of the expert panel, the expert panel process, and the results of the expert panel process; and disposition and evaluation results for each MSO, etc.). High level methodology used as part of the transition process should be included in the 10 CFR 50.48(c) License Amendment Request/Transition Report.	The results are documented in: • MSO Expert Panel Review Report, ARS-DB-11-0005 • Safe Shutdown Analysis, EPM Report, R1957-022-001, Revision 0 • Task 5.2, Component Selection Calculation, C-FP-013.10-017 • Fire Risk Evaluation Calculations (to be contained in Attachment C of the Transition Report) Collectively, these reports provide a detailed description of the MSO identification, analysis, disposition, and evaluation results.

G. Recovery Actions Transition

69 Pages Attached

In accordance with guidance provided in NEI 04-02, FAQ 07-0030, Revision 5, and RG 1.205, the following methodology was used to determine recovery actions required for compliance (i.e., determining the population of post-transition recovery actions). The methodology consisted of the following steps:

- Step 1: Define the primary control station(s) and determine which pre-transition OMAs are taken at primary control station(s) (Activities that occur in the Main Control Room are not considered pre-transition OMAs). Activities that take place at primary control station(s) or in the Main Control Room are not recovery actions, by definition.
- Step 2: Determine the population of recovery actions that are required to resolve VFDRs (to meet the risk acceptance criteria or maintain a sufficient level of defense in depth).
- Step 3: Evaluate the additional risk presented by the use of recovery actions required to demonstrate the availability of a success path
- Step 4: Evaluate the feasibility of the recovery actions
- Step 5: Evaluate the reliability of the recovery actions

An overview of these steps and the results of their implementation are provided below.

Step 1 - Clearly define the primary control station(s) and determine which pre-transition OMAs are taken at primary control station(s)

The first task in the process of determining the post-transition population of recovery actions was to apply the NFPA 805 definition of recovery action and the RG 1.205 definition of primary control station to determine those activities that are taken at primary control stations. The primary control station was determined based on the definition provided in RG 1.205 and by following the additional guidance in FAQ 07-0030.

Results of Step 1:

Based on the definition provided in RG 1.205 and the additional guidance provided in FAQ 07-0030, the following locations are considered primary control stations:

- Auxiliary Shutdown Panel (ASP) located in Fire Compartment R-01, Auxiliary Shutdown Panel Room.

  Transfer switches are installed on the ASP to transfer control or instrument signals from their normal circuit to the ASP. With the control circuit or instrument loop transferred to the ASP, the circuit is disconnected from any cables leading to the Control Room or process racks and is therefore independent of the original fire areas of concern. The ASP is powered through two redundant sources (one from each train – Y108 or Y208) through an automatic bus transfer switch.

Table G-1 – "Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station" identify the activities that occur at the primary control stations. The activities performed at the primary control stations do not require the analysis of additional risk and are compliant with NFPA 805, Section 4.2.3.1.

The ASP is a primary control station only for a fire that requires Main Control Room (MCR) evacuation.

Step 2 – Determine the population of recovery actions that are required to resolve VFDRs (to meet the risk or defense in depth criteria)

On a fire compartment basis all VFDRs were identified in the NEI 04-02 Table B-3 (See Attachment C). Each VFDR not brought into compliance with the deterministic approach was evaluated using the performance-based approach of NFPA 805 Section 4.2.4. The performance-based evaluations resulted in the need for recovery actions to meet the risk acceptance criteria or maintain a sufficient level of defense in depth.

Results of Step 2:

The final set of recovery actions is provided in Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station. The VFDRs associated with risk reduction recovery actions are designated ‘RR’ and the defense in depth recovery action are designated ‘DID’ in Table G-1. A third category of actions performed at the defined primary control stations are designated are designated 'PCS' in Table G-1 when command and control is not in the Main Control Room.

Step 3 – Evaluate the Additional Risk of the Use of Recovery Actions

Results were determined after consulting NFPA 805 Section 4.2.3.1 and NFPA 805 Section 4.2.4. Although NFPA 805 Section 4.2.3.1 does not allow recovery actions when using the deterministic approach, NFPA 805 Section 4.2.4 allows a risk-informed, performance-based approach, provided that the additional risk is evaluated in accordance with this section of NFPA 805.

Results of Step 3:

The set of recovery actions necessary to demonstrate the availability of a success path for the nuclear safety performance criteria was evaluated for additional risk using the process described in NEI 04-02, FAQ 07-0030 and RG 1.205 and compared against the guidelines of RG 1.174 and RG 1.205.

A discussion of the additional risk of recovery actions is provided in LAR Attachment W. Assessment of potential adverse effects of operator actions is addressed in the development of operator actions in the fire compartment specific Fire Risk Evaluations.

Recovery actions necessary to demonstrate the availability of a success path for the nuclear safety performance criteria were found to be acceptable.

Step 4 – Evaluate the Feasibility of Recovery Actions

Recovery actions were evaluated against the feasibility criteria provided in the NEI 04-02, FAQ 07-0030, Revision 5, and RG 1.205. Note that since actions taken at the primary control station are not recovery actions their feasibility is evaluated in accordance with procedures for validation of off normal procedures.

Results of Step 4:

Each of the feasibility criteria in FAQ 07-0030 were assessed for the recovery actions listed in Tables G-1. This NFPA 805 recovery action feasibility assessment is included in Davis-Besse Nuclear Power Station PRA Notebook 10-03: Fire PRA Human Reliability Analysis. The assessment addresses the post-fire operator actions credited as recovery actions required to resolve VFDRs to meet risk or required to meet defense in depth criteria. The defense in depth recovery actions have been conservatively retained to provide plant operations with written guidance where such actions will enhance Echelon #3 of defense in depth, to provide additional assurance that one success path of safe shutdown capability can be restored in the event that Echelon #1 and Echelon #2 of defense in depth become degraded or rendered ineffective.

Recovery actions in existing procedures have been identified. Credit was taken for previous completed procedure reviews that assessed feasibility for the recovery actions. The feasibility of the recovery actions currently in plant procedures was also assessed against NFPA 805 acceptance criteria and documented in a feasibility assessment report.

Recovery actions not currently in existing Appendix R response procedures have been identified. For recovery action compliance strategies, recovery actions have been reviewed for feasibility by site personnel during Defense in Depth (DID) Expert Panel meetings conducted as part of the Fire Risk Evaluation process. The DID Expert Panel considered/discussed recovery actions deemed necessary to place the plant in a safe and stable condition. In addition to the DID Expert Panel Review, the feasibility of the recovery actions not currently in plant procedures was assessed against NFPA 805 acceptance criteria using plant Operations Department personnel. This was documented in a feasibility assessment report.

The DID Expert Panel has determined that all recovery actions listed in Table G-1 are acceptable. Procedure updates for the credited NFPA 805 recovery actions and fire area analysis results will be completed as part of LAR implementation (see Attachment S, Table S-2, DB-1941). Confirmatory demonstration of the feasibility for the credited NFPA 805 recovery actions will be performed after procedures are updated and documented as part of LAR implementation (see Attachment S, Table S-2, DB-1941). Training will be updated after completion of the procedures (see Attachment S, Table S-2, DB-1941). Fire brigade drills will be updated after completion of the procedures and training (see Attachment S, Table S-2, DB-1941).

The overall results of the feasibility assessment demonstrate that NFPA 805 recovery actions are creditable and feasible.

Step 5 – Evaluate the Reliability of Recovery Actions

The reliability of recovery actions modeled specifically in the Fire PRA was addressed using Fire PRA methods. The evaluation of the reliability of recovery actions depends upon its characterization.

- The reliability of recovery actions that are modeled specifically in the Fire PRA will be addressed using Fire PRA methods (i.e., Human Reliability Analysis - HRA).

- The reliability of recovery actions not modeled specifically in the Fire PRA is bounded by the treatment of additional risk associated with the applicable VFDR. In calculating the additional risk of the VFDR, the compliant case recovers the fire-induced failures as if the variant condition no longer exists. The resulting delta risk between the variant and compliant condition bounds any additional risk for the recovery action even if that recovery action were not modeled.

Results of Step 5:

The reliability of recovery actions modeled specifically in the Fire PRA was addressed in Davis-Besse Nuclear Power Station PRA Notebook 10-03: Fire PRA Human Reliability Analysis.

An implementation item is identified to review and update (if needed) the Fire HRA upon completion of the procedure updates, modifications and training (see Attachment S, Table S-2, DB-1943).

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-01 A-02 A-03 A-04 A-05 A-06 A-07 A-08 A-09 AB-01 AB-02 AB-03 AB-04 AB-05 AB-06 AC-01 AD-01 B-01 BD-01 BE-01 BF-01 BG-01 BH-01 BM-01 BN-01 CC-01 D-01 DD-01 DF-01 DG-01 DH-01 E-01 EE-01 EF-01 F-01 FF-01 FF-02	ICS11A ICS11B	MS Line 2 Atmospheric Vent MS Line 1 Atmospheric Vent	Operate the valves with the reach rod for ICS11A or ICS11B.	DB-1318[(1)]	RR

[(1)] Due to the potential loss of instrument air, manual operation of the AVVs could be necessary in all fire compartments.

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-03 G-01 G-02 G-03 HH-01 II-01 II-02 II-03 II-04 II-05 II-06 II-07 II-08 II-09 J-01 J-02 K-01 K-02 MA-01 MB-01 MC-01 ME-01 MF-01 MG-01 MH-01 OS P-01 P-02 P-03 Q-01 R-01 S-01 T-01 U-01 UU-01 V-01 VA-01	ICS11A ICS11B (cont.)	MS Line 2 Atmospheric Vent MS Line 1 Atmospheric Vent (cont.)	Operate the valves with the reach rod for ICS11A or ICS11B. (cont.)	DB-1318[1] (cont.)	RR (cont.)

[1] Due to the potential loss of instrument air, manual operation of the AVVs could be necessary in all fire compartments.

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
X-01 X-02 Y-01 Y-02	ICS11A ICS11B (cont.)	MS Line 2 Atmospheric Vent MS Line 1 Atmospheric Vent (cont.)	Operate the valves with the reach rod for ICS11A or ICS11B. (cont.)	DB-1318[1] (cont.)	RR (cont.)
A-01 A-02 A-03 A-04 A-05 A-06 A-07 A-08 A-09 AB-01 AB-02 AB-03 AB-04 AB-05 AB-06 AC-01 AD-01 B-01 BD-01 BE-01 BF-01 BG-01 BH-01 BM-01 BN-01 CC-01 D-01 DD-01 DF-01 DG-01 DH-01 E-01	P296-1 P296-2	FLEX CHARGING PUMP 1 FLEX CHARGING PUMP 2	Deploy 480VAC Generator. Manually align FLEX RCS Charging Pump.	DB-2012[2]	RR

(1) Due to the potential loss of instrument air, manual operation of the AVVs could be necessary in all fire compartments.

(2) A FLEX RCS Charging Pumps modification will be installed to reduce risk in all fire compartments. (ECP 13-0463)

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
EE-01 F-01 FF-01 FF-02 FF-03 G-01 G-02 G-03 HH-01 II-01 II-02 II-03 II-04 II-05 II-06 II-07 II-08 II-09 J-01 J-02 K-01 K-02 MA-01 MB-01 MC-01 ME-01 MF-01 MG-01 MH-01 OS P-01 P-02 P-03 Q-01 R-01 S-01 T-01	P296-1 P296-2 (cont.)	FLEX CHARGING PUMP 1 FLEX CHARGING PUMP 2 (cont.)	Deploy 480VAC Generator. Manually align FLEX RCS Charging Pump. (cont.)	DB-2012[(2)] (cont.)	RR (cont.)

[(2)] A FLEX RCS Charging Pumps modification will be installed to reduce risk in all fire compartments. (ECP 13-0463)

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
U-01 UU-01 V-01 VA-01 X-01 X-02 Y-01 Y-02	P296-1 P296-2 (cont.)	FLEX CHARGING PUMP 1 FLEX CHARGING PUMP 2 (cont.)	Deploy 480VAC Generator. Manually align FLEX RCS Charging Pump. (cont.)	DB-2012[(2)] (cont.)	RR (cont.)
A-04	MS107A	Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-0916	RR
A-04	MS107	Main Steam Line 2 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-0925	DID
A-04	MU66A MU66D CC4200	RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-2 Pump Seal Cooler	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1380	RR
A-04	MU1A MU3 WC1747 CC1407B CC1411B	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN STOP CWRT 2 INLET FLOW CONTROL CCW FROM CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1464	DID

(2) A FLEX RCS Charging Pumps modification will be installed to reduce risk in all fire compartments. (ECP 13-0463)

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-04	C5755D C5756D	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1710	RR
A-04	AF3870 AF3872	Auxiliary Feed Pump 1 to SG 1-1 Auxiliary Feed Pump 2 to SG 1-2	Trip AFPT-2 locally.	DB-1880	RR
A-04	MS106 MS106A MS107 MS107A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-2003	RR
A-05	MS106	Main Steam Line 1 to AFPT 1 Isolation	Locally de-energize and manually align credited AFW pump to credited S/G. Close both "A" valves and non-credited S/G supply (MS106 or MS107).	DB-1175	DID
A-05	AF3869 AF3872 AF599 FV6451	Auxiliary Feed Pump 1 to Steam Generator 1-2 Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-1 locally. OR Trip AFPT-2 locally.	DB-1182	RR
A-05	FV6451 FV6452 HIS6403 HIS6404 AF3871 AF608 AF3869 AF3870	Aux FP 1-2 Solenoid Control Valve Aux FP 1-1 Solenoid Control Valve SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Init. AFP2 to SG2 & 1 Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-2 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	De-energize FV6452. OR Trip AFPT-1 locally. De-energize FV6451.	DB-1189	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-05	AF3869 AF3870 FV6451 FV6452 AF3872	Auxiliary Feed Pump 1 To SG 1-2 Auxiliary Feed Pump 1 to SG 1-1 AUX FP 1-2 Solenoid Control Valve AUX FP 1-1 Solenoid Control Valve Auxiliary Feed Pump 2 to SG 1-2	Trip AFPT-2 locally. De-energize FV6452. OR Trip AFPT-1 locally. De-energize FV6451.	DB-1198	DID
A-05	MS106 MS106A MS107 MS107A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-1 locally. OR Trip AFPT-2 locally.	DB-1529	RR
A-05	MS106 MS106A MS107 MS107A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 1 Governor	Trip AFPT-1 locally. OR Trip AFPT-2 locally.	DB-1562	DID
A-05	C5762D C5763D C5755D C5756D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Cooling, Letdown, AND CCW to containment.	DB-1711	RR
A-05	MS106 MS106A MS107 MS107A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally. OR Trip AFPT-1 locally.	DB-2003	RR
A-06	HA01 HB01	RCP 1-2-2 RCP 1-2-1	Trip RCP 1-2-2 and 1-2-1 breakers at the switchgear.	DB-1117	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-06 A-08 AB-02 AB-05 AC-01 CC-01 D-01 DD-01 DF-01 EE-01 FF-01 FF-02 MC-01 U-01 V-01 X-01 Y-01	Diesel Driven Emergency Feedwater Pump	Diesel Driven Emergency Feedwater Pump	Manually initiate and align Diesel Driven Emergency Feedwater Pump System.	DB-1421 [(3)]	RR
A-06	MU1A CC1409 MU1B CC1410	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1906	DID
A-07	MS107 ICS38A	Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-0994	DID
A-07	MS107 MS107A ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1162	RR
A-07	AF3869 AF3872 AF599 FV6451	Auxiliary Feed Pump 1 to Steam Generator 1-2 Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-2 locally.	DB-1182	RR
A-07	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1531	RR

(3) A diesel-driven Emergency Feedwater (EFW) Pump modification will be installed to reduce risk in all fire compartments. The fire compartments listed will have components or cables that could require recovery actions to manually start the EFW Pump. (ECP 13-0195 & 13-0196)

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-07	C5755D C5756D	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1712	RR
A-08	AC105 AD105 MU19 MU32 MU6406 MU6408 MU66A MU66D MU6420 MU6422	MAKE-UP PUMP 1-1 BREAKER MAKE-UP PUMP 1-2 BREAKER Seal Injection Inlet Isolation Valve MAKE-UP FLOW CONTROLLER MAKE-UP PUMP 2 RECIRCULATION ISOL MAKE-UP PUMP 2 TO SEAL INJECTION CROSS-X RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet Normal Make-up Flow Controller Normal Make-up to Reactor Coolant System	Remove control power fuses and trip the AD105 breaker at the switchgear.	DB-1023	DID
A-08	AD210	MOTOR DRIVEN FEED PUMP BREAKER	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1024	DID
A-08	HA01 HA03 HB01 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-2-1 RCP 1-1-2	Trip RCP 1-2-2, 1-1-1, 1-2-1 and 1-1-2 breakers at switchgear.	DB-1027	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-08	MU19 MU208 MU66A MU66D CC4100 CC4200 CC4300 CC4400	Seal Injection Inlet Isolation Valve Seal Injection Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 1-2 Pump Seal Cooler Reactor Coolant Pump 2-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1029	RR
A-08	MS107	Main Steam Line 2 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-1030	RR
A-08	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3 MU4 MU10A MU11 CC1407B CC1411A CC1411B CC5095 CC5097	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION LETDOWN STOP LETDOWN BLOCK ORIFICE ISOLATION MIXED BED 1 LETDOWN INLET THREE-WAY LETDOWN TO RADWASTE DRAIN CCW FROM CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION CCW LINE 1 DISCHARGE ISOLATION CCW LINE 1 RETURN ISOLATION	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1031	DID
A-08	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1033	DID
A-08	SW1356 SW1366	CTMT AIR COOLER 1 OUTLET TEMP CONTROL CONTAINMENT AIR COOLER 1 INLET ISOLATION	Place Containment Air Cooler 1 in service after the fire is extinguished (within 120 minutes).	DB-1034	DID
A-08	MS106	Main Steam Line 1 to AFPT 1 Isolation	De-energize MS106 and manually open.	DB-1178	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-08	FV6452 HIS6403 HIS6404 AF3871 AF608 AF3870	Aux FP 1-1 Solenoid Control Valve SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Initiation AFP2 to SG2 & 1 Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Trip AFPT-2 locally. De-energize FV6452. De-energize AF3870 and manually open.	DB-1185	RR
A-08	FV6452 AF3870 AF608 HIS6403 HIS6404	Auxiliary Feed Pump 1-1 Discharge Control Solenoid Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Init. AFP2 to SG2 & 1	Trip AFPT-2 locally. De-energize FV6452.	DB-1199	DID
A-08	P56-2 CS1531	Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1227	DID
A-08	P56-2 CS1531	Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1268	DID
A-08	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1403	DID
A-08	MS107A	Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-1532	RR
A-08	C5762D C5763D C5755D C5756D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Cooling, Letdown, AND CCW to containment.	DB-1711	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-08	MS106 MS106A MS107 MS107A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-2003	RR
A-08	K5-2	EDG 2	Manually start and load EDG.	DB-2034	DID
A-08	AF3870 AF3872	Auxiliary Feed Pump 1 to SG 1-1 Auxiliary Feed Pump 2 to SG 1-2	Trip AFPT-2 locally.	DB-1880	RR
A-09	AD111 HP2A HP2B	High Pressure Injection Pump 1-2 Breaker High Pressure Injection Line 1-1 Isolation High Pressure Injection Line 1-2 Isolation	Remove control power fuses and trip AD111 breaker at the switchgear.	DB-0992	DID
A-09	MS107 ICS38A	Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-0994	DID
A-09	MS107 MS107A MS5889B ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation Steam Admission to AFPT 2 AFPT 2 Governor	Trip AFPT-2 locally.	DB-1163	RR
A-09	AF3872 AF599 FV6451	Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-2 locally.	DB-1183	RR
A-09	FV6452 HIS6403 HIS6404 AF3871 AF608 AF3870	Aux FP 1-1 Solenoid Control Valve SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Initiation AFP2 to SG2 & 1 Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Trip AFPT-2 locally. De-energize FV6452. De-energize AF3870 and manually open.	DB-1185	RR
A-09	P56-2 CS1531	Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1227	DID
A-09	P56-2 CS1531	Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1268	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
A-09	MU19 MU66A MU66D CC4200 CC4300	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-2 Pump Seal Cooler Reactor Coolant Pump 1-2- Pump Seal Cooler	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1381	RR
A-09	MU1A MU2B MU3 MU11 WC1743 CC1411B	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLERS INLET ISOLATION LETDOWN STOP THREE-WAY LETDOWN TO RADWASTE DRAIN CWRT 1 INLET FLOW CONTROL CCW TO CONTAINMENT ISOLATION	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1392	DID
A-09	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1531	RR
A-09	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1656	DID
A-09	PISP12B PISP12B2 PTSP12B1 PTSP12B2	Steam Generator 1 Pressure Indicator Pressure Indicator For Steam Gen Steam Generator 1 Outlet Steam Pressure Steam Generator 1 Outlet Steam Pressure	Utilize PISP12B1 indication at the ASP.	DB-1707	DID
A-09	C5762D C5763D C5755D C5756D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Cooling, Letdown, AND CCW to containment.	DB-1711	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)					
Fire Compartment	**Component ID**	**Component Name**	**Recovery Actions**	**VFDR**	**PCS/ RR/ DID**
A-09	LISP9B1	SG 1 Startup Range Level	Utilize LISP9B3 indication at the ASP	DB-1750	DID
AB-01	AD105	MAKE-UP PUMP 1-2 BREAKER	Remove control power fuses and open AD105 breaker. Re-energize D1_EA bus.	DB-1014	RR
AB-01	MU2A MU2B	LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1119	DID
AB-01	AC105 MU6419 MU6421	MAKE-UP PUMP 1-1 BREAKER MAKE-UP ALTERNATE INJECTION THROTTLE MAKE-UP TO REACTOR COOLANT SYSTEM TRAIN	Remove control power fuses and trip AC105 breaker at the switchgear.	DB-1476	DID
AB-01	MS106A	Main Steam Line 2 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-1534	RR
AB-01	C5762D C5763D PTRC2B3 PTRC2B4	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel RCS Pressure RCS Pressure	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1713	RR
AB-01	AC111 HP2C HP2D	High Pressure Injection Pump 1-1 Breaker High Pressure Injection Line 1-1 Isolation High Pressure Injection Line 1-2 Isolation	Remove control power fuses and trip AC111 breaker at the switchgear.	DB-1013	DID
AB-02	MU2A MU2B	LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1119	DID
AB-02	HA03 HB03	RCP 1-1-1 RCP 1-1-2	Trip RCP 1-1-1 and 1-1-2 breakers at switchgear.	DB-1120	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
AB-03	MU19 MU66A MU66B MU66C MU66D CC4100 CC4400	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1127	RR
AB-03	MU38 MU59A MU59B MU59C MU59D	RCP SEAL RETURN ISOLATION RCP 2-1 Seal Return RCP 2-2 Seal Return RCP 1-1 Seal Return RCP 1-2 Seal Return	Isolate instrument air to MU38 and vent to fail closed.	DB-1128	DID
AB-03	MS101-1	Main Steam Line 1 MSIV Bypass (Train 1)	De-energize SFRCS to prevent MSIV bypass valves from spuriously opening.	DB-1234	DID
AB-03	MU2A MU2B MU3 MU4 MU11	LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION LETDOWN STOP LETDOWN BLOCK ORIFICE ISOLATION THREE-WAY LETDOWN TO RADWASTE DRAIN	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1466	DID
AB-04	AD105	MAKE-UP PUMP 1-2 BREAKER	Remove control power fuses and open AD105 breaker. Re-energize D1_EA bus.	DB-1305	DID
AB-04	MU2A MU2B MU3 MU11	LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION LETDOWN STOP THREE-WAY LETDOWN TO RADWASTE DRAIN	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1467	DID
AB-04	MS106A	Main Steam Line 2 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-1534	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
AB-04	C5755D C5756D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1714	RR
AB-04	AC105 AD105 MU6408 MU6409 MU66A MU66B MU66C MU66D	MAKE-UP PUMP 1-1 BREAKER MAKE-UP PUMP 1-2 BREAKER MAKE-UP PUMP 2 TO SEAL INJECTION CROSS-X MAKE-UP PUMP 1 TO SEAL INJECTION CROSS-X RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet	Remove control power fuses and trip AC105 breaker at the switchgear. Remove control power fuses and trip AD105 breaker at the switchgear.	DB-2004	DID
AB-05	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1217	DID
AB-05	MS101-1	Main Steam Line 1 MSIV Bypass (Train 1)	De-energize SFRCS to prevent MSIV bypass valves from spuriously opening.	DB-1235	DID
AB-05	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1258	DID
AB-05	HA03 HB03	RCP 1-1-1 RCP 1-1-2	Trip RCP 1-1-1 and 1-1-2 breakers at the switchgear.	DB-1290	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
AB-05	C71-1 HV5305A HV5305B	LOW VOLTAGE SWITCHGEAR ROOM 1 VENT FAN Low Voltage Switchgear Room 429 Vent Damper Low Voltage Switchgear Room 429 Vent Damper	Provide temporary ventilation to prevent loss of E1 bus.	DB-1342	DID
AB-05	MU19 MU66A MU66B MU66C MU66D CC1407A CC1411A CC4100 CC4400	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet CCW From Containment Isolation CCW to Containment Isolation Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1383	RR
AB-05	MU1A CC1407A CC1409 MU1B CC1410 CC1411A MU2A MU2B MU3	REACTOR COOLANT LETDOWN COOLER 1 INLET CCW From Containment Isolation LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET CCW to Containment Isolation LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION Letdown Stop	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1468	DID
AB-05	MS106A	Main Steam Line 2 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-1534	RR
AB-05	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1659	DID
AB-05	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3	Reactor Coolant Letdown Cooler 1 Inlet Letdown Cooler 1 CCW Inlet Reactor Coolant Letdown Cooler 2 Inlet Letdown Cooler 2 CCW Inlet Letdown Coolers Outlet Isolation Letdown Coolers Outlet Isolation Letdown Stop	Isolate instrument air to MU3 and vent to fail closed.	DB-1682	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
AB-05	C5762D C5763D C5755D C5756D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Cooling, Letdown, AND CCW to containment.	DB-1711	RR
AB-05	MU38 MU59A MU59B MU59C MU59D	RCP SEAL RETURN ISOLATION RCP 2-1 Seal Return RCP 2-2 Seal Return RCP 1-1 Seal Return RCP 1-2 Seal Return	Isolate instrument air to MU38 and vent to fail closed.	DB-1873	DID
AC-01	MS107A	Main Steam Line 1 to AFPT 2 Isolation	De-energize MS107A and manually close.	DB-1931	RR
BF-01	AC107 AD107 AC109 SW1399 P3-1 P3-2 P3-3	SW Pump 1-1 Breaker SW Pump 1-2 Breaker SW Pump 1-3 Breaker TPCW Heat Exchanger Inlet Header Isolation SW Pump 1-1 SW Pump 1-2 SW Pump 1-3	Manually close SW45. Place Backup Service Water Pump 1-1 (P180) in-service.	DB-0914	RR
BF-01	AC107	SW PMP 1-1 BREAKER	Remove control power fuses and trip AC107 at switchgear. Re-energize C1 bus. Place Backup Service Water Pump 1-1 (P180) in-service.	DB-0915	DID
BF-01	MS107A	Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-0916	RR
BF-01	MS107	Main Steam Line 2 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-0925	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
BF-01	AC202	CLNG TWR MU PUMP 1-1 BREAKER	Remove control power fuses and trip AC202 breaker at the switchgear. Re-energize C2 bus. Place Backup Service Water Pump 1-1 (P180) in service.	DB-1289	DID
BF-01	C5755D C5756D	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1710	RR
BF-01	AF3870 AF3872	Auxiliary Feed Pump 1 to SG 1-1 Auxiliary Feed Pump 2 to SG 1-2	Trip AFPT-1 locally.	DB-1879	RR
BF-01	MS106 MS106A MS107 MS107A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-2003	RR
BG-01	MS107A	Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-0916	RR
BG-01	SW1399	TPCW HEAT EXCHANGER INLET HEADER ISOLATION	Manually close SW54. Manually close SW55. Manually close SW56.	DB-0924	DID
BG-01	MS107	Main Steam Line 2 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-0925	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
BG-01	C5755D C5756D	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1716	RR
BG-01	AF3870 AF3872	Auxiliary Feed Pump 1 to SG 1-1 Auxiliary Feed Pump 2 to SG 1-2	Trip AFPT-1 locally.	DB-1879	RR
BG-01	MS106 MS106A MS107 MS107A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-2003	RR
CC-01	AC111 HP2C HP2D	High Pressure Injection Pump 1-1 Breaker High Pressure Injection Line 1-1 Isolation High Pressure Injection Line 1-2 Isolation	Remove control power fuses and trip AC111 breaker at the switchgear.	DB-1013	DID
CC-01	MS106 MS106A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1164	RR
CC-01	AF3870 FV6452	Auxiliary Feed Pump 1 to SG 1-2 AUX FP 1-1 Solenoid Control Valve	Trip AFPT-1 locally.	DB-1184	RR
CC-01	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1217	DID
CC-01	MS101-1	Main Steam Line 1 MSIV Bypass (Train 1)	De-energize SFRCS to prevent MSIV bypass valves from spuriously opening.	DB-1236	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
CC-01	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1258	DID
CC-01	MU38 MU59A MU59B MU59C MU59D	RCP SEAL RETURN ISOLATION RCP 2-1 Seal Return RCP 2-2 Seal Return RCP 1-1 Seal Return RCP 1-2 Seal Return	Isolate instrument air to MU38 and vent to fail closed.	DB-1296	DID
CC-01	MU19 MU66A MU66B MU66C MU66D CC4100 CC4200 CC4300 CC4400	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 1-2 Pump Seal Cooler Reactor Coolant Pump 2-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1384	RR
CC-01	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3 MU4 MU10B MU11 WC1453 WC1747 WC3560 CC1407A CC1411A	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS OUTLET ISOLATION LETDOWN STOP LETDOWN BLOCK ORIFICE ISOLATION MIXED BED 2 LETDOWN INLET THREE-WAY LETDOWN TO RADWASTE DRAIN PRIMARY DEMINERALIZER INLET TEMPERATURE CWRT 2 INLET FLOW CONTROL DEGASIFIER BYPASS FLOW CONTROL CCW FROM CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1469	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)					
Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
CC-01	AC105 MU6419 MU6421 MU6409 MU66A MU66B MU66C MU66D	MAKE-UP PUMP 1-1 BREAKER MAKE-UP ALTERNATE INJECTION THROTTLE MAKE-UP TO REACTOR COOLANT SYSTEM TRAIN MAKE-UP PUMP 1 TO SEAL INJECTION CROSS-X RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet	Remove control power fuses and trip AC105 breaker at the switchgear.	DB-1477	DID
CC-01	DC-PZR-HTR-ESS-1	PZR-HTR-ESS-1	Operate pressurizer heaters power supply breakers at switchgear.	DB-1484	DID
CC-01	MS106A ICS38B	Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1538	RR
CC-01	MS106 ICS38B	Main Steam Line 1 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1539	DID
CC-01	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1675	DID
CC-01	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3	Reactor Coolant Letdown Cooler 1 Inlet Letdown Cooler 1 CCW Inlet Reactor Coolant Letdown Cooler 2 Inlet Letdown Cooler 2 CCW Inlet Letdown Coolers Outlet Isolation Letdown Coolers Outlet Isolation Letdown Stop	Isolate instrument air to MU3 and vent to fail closed.	DB-1683	DID
CC-01	DC-TURB-TRIP-1 DC-TURB-TRIP-2	DC-TRUB-TRIP-1 DC-TRUB-TRIP-2	Manually trip the turbine using the manual trip pushbutton at the front standard.	DB-1923	DID
CC-01	PT2003 Pwr Supply Y1 for channel 1	Containment Pressure Transmitter Power supply Y1 for Channel 1	Remove control power fuses and stop the containment spray pumps at switchgear. Take local control of credited train components at switchgear. Remove SFAS power to valves at D1P to allow restoration of required components.	DB-1924	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
CC-01	FV6452 AF3869	Aux FP 1-1 Solenoid Control Valve Auxiliary Feed Pump 1 to Steam Generator 1-2	Trip AFPT-1 locally.	DB-1925	RR
D-01	HA01 HA03 HB01 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-2-1 RCP 1-1-2	Trip RCP 1-2-2, 1-1-1, 1-2-1 and 1-1-2 breakers at switchgear.	DB-1286	RR
D-01	MU1A MU2A MU2B MU3 MU4 MU10A MU11 WC1743 CC1407A CC1411A CC1411B	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION LETDOWN STOP LETDOWN BLOCK ORIFICE ISOLATION MIXED BED 1 LETDOWN INLET THREE-WAY LETDOWN TO RADWASTE DRAIN CWRT 1 INLET FLOW CONTROL CCW FROM CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1470	DID
D-01	CC4100 CC4200 CC4300 CC4400 CC1407A CC1411A	Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 2-1 Pump Seal Cooler Reactor Coolant Pump 1-2- Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler CCW From Containment Isolation CCW To Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1639	RR
D-01	C1-1 C1-2	CONTAINMENT AIR COOLER FAN 1 CONTAINMENT AIR COOLER FAN 2	Return one of the Containment Air Coolers to service as soon as possible.	DB-1887	DID
DD-01	MS106 MS106A MS5889A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Steam Admission to AFPT 1 AFPT 1 Governor	Control AFPT-1 using ICS38B from ASP.	DB-1160	PCS

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DD-01	MS106 MS106A MS5889A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Steam Admission to AFPT 1 AFPT 1 Governor	De-energize MS106 and manually open. De-energize MS106A and manually close.	DB-1160	RR
DD-01	MS107 MS107A MS5889B ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation Steam Admission to AFPT 2 AFPT 2 Governor	Trip AFPT-2 locally.	DB-1165	DID
DD-01	MS106 MS106A MS5889A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Steam Admission to AFPT 1 AFPT 1 Governor	Control AFPT-1 using ICS38B from ASP.	DB-1179	PCS
DD-01	MS106 MS106A MS5889A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Steam Admission to AFPT 1 AFPT 1 Governor	Trip AFPT-2 locally.	DB-1179	RR
DD-01	FV6452 HIS6403 HIS6404 AF3871 AF608 AF3870	Aux FP 1-1 Solenoid Control Valve SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Initiation AFP2 to SG2 & 1 Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Control AFPT-1 using ICS38B from ASP.	DB-1185	PCS
DD-01	FV6452 HIS6403 HIS6404 AF3871 AF608 AF3870	Aux FP 1-1 Solenoid Control Valve SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Initiation AFP2 to SG2 & 1 Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Trip AFPT-2 locally. De-energize FV6452. De-energize AF3870 and manually open.	DB-1185	RR
DD-01	FV6452 AF3870 AF608 HIS6403 HIS6404	Auxiliary Feed Pump 1-1 Discharge Control Solenoid Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Init. AFP2 to SG2 & 1	Trip AFPT-2 locally. De-energize FV6452. De-energize AF3870 and manually open. De-energize AF608 and manually open.	DB-1199	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DD-01	FV6452 AF3870 AF608 HIS6403 HIS6404	Auxiliary Feed Pump 1-1 Discharge Control Solenoid Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Init. AFP2 to SG2 & 1	Control AFPT-1 using ICS38B from ASP.	DB-1199	PCS
DD-01	CC1467 CC1495	CCW from Decay Heat Cooler 1 Solenoid CCW to Auxiliary Building Non-essentials	Close CC42.	DB-1207	DID
DD-01	P56-1 CS1530 P56-2 CS1531	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1218	DID
DD-01	C1_41 AC101 AC110 E1	4.16KV Essential Switchgear Bus "C1" DG 1-1 BREAKER Bus Tie C2 BREAKER E1 480V Bus	Procedurally driven actions being taken away from the primary control station to establish power.	DB-1229	DID
DD-01	MS100 MS101 MS100-1 MS101-1	Main Steam Line 2 Isolation (Train 2) Main Steam Line 1 Isolation (Train 1) Main Steam Line 2 MSIV Bypass (Train 2) Main Steam Line 1 MSIV Bypass (Train 1)	De-energize SFRCS to close MSIVs and prevent bypass valves from spuriously opening.	DB-1237	DID
DD-01	PS3687A PS3687C PS3689B PS3689D PS3687E PS3687G PS3689F PS3689H	Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS	Verify AFPT-2 tripped. De-energize FV6452. Manually align AFPT-1 to feed the credited S/G.	DB-1242	DID
DD-01	ACB34560 ACB34561	Generator Output Breaker Generator Output Breaker	Locally open the main generator output breakers. Identify and respond to adverse plant conditions associated with not automatically tripping the main generator.	DB-1246	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DD-01	P56-1 CS1530 P56-2 CS1531	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1260	DID
DD-01	C1-1 SW1356 SW1366	CONTAINMENT AIR COOLER FAN 1 CTMT AIR COOLER 1 OUTLET TEMP CONTROL CONTAINMENT AIR COOLER 1 INLET ISOLATION	Place Containment Air Cooler 1 in service.	DB-1293	DID
DD-01	K5-1	EDG 1	Manually start and load EDG.	DB-1303	DID
DD-01	P3-1 P43-1 AC107 AC113	SW Pump 1-1 CCW Pump 1-1 SW PMP 1-1 BREAKER CC PMP 1-1 BREAKER	Start or verify CC pump in service.	DB-1306	DID
DD-01	HV5305A HV5305B	Low Voltage Switchgear Room 429 Vent Damper Low Voltage Switchgear Room 429 Vent Damper	Provide temporary ventilation to prevent loss of E1 bus.	DB-1343	DID
DD-01	MU19 MU66A MU66B MU66C MU66D CC4100 CC4200 CC4300 CC4400 CC5095 CC5096 CC5097 CC5098 CC1407A CC1407B CC1411A CC1411B	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 1-2 Pump Seal Cooler Reactor Coolant Pump 2-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler CCW Line 1 Discharge Isolation CCW Line 2 Discharge Isolation CCW Line 1 Return Isolation CCW Line 2 Return Isolation CCW From Containment Isolation CCW From Containment Isolation CCW to Containment Isolation CCW to Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1385	RR
DD-01	RC11 RC2A	PORV Block RC11 Pressurizer Power Relief	Place disconnect switch in LOCAL. Close RC11 at switchgear.	DB-1393	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DD-01	IIMU24A MU6420 MU6419 MU6421	RCS Makeup Pump 1 Amps (ammeter) Normal Make-Up Flow Controller Bypass Make-up Alternate injection Throttle Make-up to reactor Coolant Train	Monitor and maintain pressurizer level by manual control of MU6420.	DB-1399	DID
DD-01	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1404	DID
DD-01	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1406	DID
DD-01	AC111 AD111 HP2A HP2B HP2C HP2D	High Pressure Injection Pump 1-1 Breaker High Pressure Injection Pump 1-2 Breaker High Pressure Injection Line 1-1 Isolation High Pressure Injection Line 1-2 Isolation High Pressure Injection Line 1-1 Isolation High Pressure Injection Line 1-2 Isolation	Remove control power fuses and trip AC111 breaker at the switchgear. Remove control power fuses and trip AD111 breaker at the switchgear.	DB-1460	DID
DD-01	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3 MU4 MU11	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN STOP LETDOWN BLOCK ORIFICE ISOLATION THREE-WAY LETDOWN TO RADWASTE DRAIN	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1471	DID
DD-01	MU6409 MU6419 MU6420 MU6421 MU6422 AC105 AD105 MU66A MU66B MU66C MU66D MU6408	Make-up Pump 1 to Seal Injection Cross Make-up Alternate injection Throttle Normal Make-up Flow Controller Bypass Make-up to reactor Coolant Train Normal Make-up to Reactor Coolant System Make Up Pump 1-1 BREAKER Makeup Pump 1-2 BREAKER RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet MAKE-UP PUMP 2 TO SEAL INJECTION CROSS-X	Remove control power fuses and trip AC105 breaker at the switchgear. Remove control power fuses and trip AD105 breaker at the switchgear.	DB-1478	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DD-01	DC-PZR-HTR-1 DC-PZR-HTR-2 DC-PZR-HTR-3 DC-PZR-HTR-4 DC-PZR-HTR-ESS-1 DC-PZR-HTR-ESS-2	PZR-HTR-1 PZR-HTR-2 PZR-HTR-3 PZR-HTR-4 PZR-HTR-ESS-1 PZR-HTR-ESS-2	Operate pressurizer heaters power supply breakers at switchgear.	DB-1486	DID
DD-01	SW1399	TPCW Heat Exchanger Inlet Header Isolation	Manually close SW54. Manually close SW55. Manually close SW56.	DB-1491	DID
DD-01	ICS11A ICS11B	MS Line 2 Atmospheric Vent MS Line 1 Atmospheric Vent	Close the valve that spuriously opens with the reach rod for ICS11A or ICS11B.	DB-1493	DID
DD-01	C5662D C5663D C5755D C5756D PT2000 PT2001 PT2002 PT2003 PTRC2A3 PTRC2A4 PTRC2B3 PTRC2B4	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel Containment Pressure Transmitter Containment Pressure Transmitter Containment Pressure Transmitter Containment Pressure Transmitter RCS Pressure RCS Pressure RCS Pressure RCS Pressure	Remove control power fuses and stop the containment spray pumps at switchgear. Take local control of credited train components at switchgear. Remove SFAS power to valves at D1P to allow restoration of required components.	DB-1496	RR
DD-01	ICS38B LISP9A3 LISP9B3 PI6365B1 PISP12A1 PISP12B1 SW1382 FI6425 LIRC14-1	AFPT 1 Governor Steam Generator 1-2 Start-up Level Ind. Steam Generator 1-1 Start-up Level Ind. RC Extended Range Pressure Indicator Steam Generator 1-2 Outlet Steam Pressure Steam Generator 1-1 Outlet Steam Pressure Service Water Supply to Auxiliary Feed Makeup Flow Indication Reactor Coolant Pressurizer Channel 1 Level	Procedurally driven actions being taken away from the primary control station to maintain plant operations.	DB-1526	RR
DD-01	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1540	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DD-01	MS106A MS107 ICS38A ICS38B	Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor AFPT 1 Governor	Trip AFPT-2 locally. De-energize MS106A and manually close.	DB-1573	RR
DD-01	P371 P371B P371D MU6405 MU6407 MU6409 MU6420 MU6422	Make-up Pump 1-1 Main Lube Oil Pump for P37-1 Auxiliary Gear Lube Oil Pump For P37-1 Makeup Pump 1 Recirculation Isol-3 WAY Makeup Pump 1 Recirculation Isol Makeup Pump 1 to Seal Injection Cross Normal Make-up Flow Controller Bypass Normal Make-up to Reactor Coolant System	Locally start credited Makeup Pump. Locally align credited Makeup Pump auxiliaries. Manually control makeup flow.	DB-1616	DID
DD-01	MU38 MU59A MU59B MU59C MU59D	RCP SEAL RETURN ISOLATION RCP 2-1 Seal Return RCP 2-2 Seal Return RCP 1-1 Seal Return RCP 1-2 Seal Return	Isolate instrument air to MU38 and vent to fail closed.	DB-1620	DID
DD-01	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1676	DID
DD-01	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN STOP	Isolate instrument air to MU3 and vent to fail closed.	DB-1684	DID
DD-01	HA01 HA03 HB01 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-2-1 RCP 1-1-2	Trip RCP 1-2-2, 1-1-1, 1-2-1 and 1-1-2 breakers at switchgear.	DB-1826	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DD-01	C6708 C6709 C6714 C6715 C21-1 S33-1 SW2927 SV4823A	MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR EMERG SYS SUPPLY FAN CREVS 1 CONDENSING UNIT CONTROL ROOM EMERGENCY CONDENSER 1 TEMP CONTROL ROOM EMERGENCY VENTILATION SYSTEM	Provide temporary ventilation for the MCR.	DB-1828	DID
DD-01	Emergency Trip push button	Emergency Trip push button	Manually trip the turbine using the manual trip pushbutton at the front standard.	DB-1829	DID
DD-01	NI5874C-1 TERC3A6 TERC3B5 TERC4A2 TERC4B3	Nuclear Instrumentation RC LOOP 2 HLG WR TEMP ELEMENT RC LOOP 1 HLG WR TEMP ELEMENT RCP 2-1 DISCH CLG WR TEMP ELEMENT RCP 1-2 DISCH CLG NR TEMP ELEMENT	Locally monitor reactivity and RCS parameters.	DB-1831	DID
DD-01	ABDC1	Bus Tie Xfmer BD	Trip all B bus supply breakers. At C1 bus, disconnect control room from bus breakers.	DB-1832	DID
DD-01	DH2735 DH2736	DH Auxiliary Spray Stop DH Auxiliary Spray Throttle	At MCC E11B, place disconnect switch to LOCAL and close DH2735. OR De-energize DH2736 and manually close.	DB-1833	DID
DD-01	AF3869 AF3872 AF599 FV6451	Auxiliary Feed Pump 1 to Steam Generator 1-2 Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Control AFPT-1 using ICS38A from ASP.	DB-2009	PCS
DD-01	AF3869 AF3872 AF599 FV6451	Auxiliary Feed Pump 1 to Steam Generator 1-2 Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-2 locally. Manually close AF599.	DB-2009	RR
DF-01	MS107 MS107A ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1166	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DF-01	MS106	Main Steam Line 1 to AFPT 1 Isolation	De-energize MS106 and manually open.	DB-1180	DID
DF-01	AF3872 AF599 FV6451	Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-2 locally.	DB-1186	RR
DF-01	P56-2 CS1531	Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1227	DID
DF-01	MS100 MS100-1	Main Steam Line 2 Isolation (Train 2) Main Steam Line 2 MSIV Bypass (Train 2)	De-energize SFRCS to close MSIVs and prevent bypass valves from spuriously opening.	DB-1231	DID
DF-01	P56-2 CS1531	Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1268	DID
DF-01	C21-1	CTRM EMERG SYS SUPPLY FAN	Remove control power and start fan at the MCC.	DB-1300	DID
DF-01	AD105 MU6420 MU6422 MU32 MU6408 MU19 MU66A MU66D	MAKE-UP PUMP 1-2 BREAKER NORMAL MAKE-UP FLOW CONTROLLER BYPASS NORMAL MAKE-UP TO REACTOR COOLANT SYSTEM MAKE-UP FLOW CONTROLLER MAKE-UP PUMP 2 TO SEAL INJECTION CROSS-X Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet	Remove control power fuses and trip AD105 breaker at the switchgear.	DB-1479	DID
DF-01	DC-PZR-HTR-1 DC-PZR-HTR-2 DC-PZR-HTR-3 DC-PZR-HTR-4 DC-PZR-HTR-ESS-2	PZR-HTR-1 PZR-HTR-2 PZR-HTR-3 PZR-HTR-4 PZR-HTR-ESS-2	Operate pressurizer heaters power supply breakers at switchgear.	DB-1487	DID
DF-01	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1541	RR
DF-01	MS107 ICS38A	Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1574	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DF-01	MU19 MU66A MU66D CC1407B CC1411B	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet CCW From Containment Isolation CCW to Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1640	RR
DF-01	AF3871 AF608 AF3870	Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Trip AFPT-2 locally.	DB-1914	RR
DF-01	DC-TURB-TRIP-1 DC-TURB-TRIP-2	DC-TRUB-TRIP-1 DC-TRUB-TRIP-2	Manually trip the turbine using the manual trip pushbutton at the front standard.	DB-1923	DID
DF-01	DC-SFAS-L2-CH2 DC-SFAS-L4-CH4	SFAS LEVEL 2 CHANNEL 2 SFAS LEVEL 2 CHANNEL 4	Remove control power fuses and stop the containment spray pumps at switchgear. Take local control of credited train components at switchgear. Remove SFAS power to valves at D1P to allow restoration of required components.	DB-1927	RR
DF-01	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-2026	DID
DF-01	MU1A MU2B MU3 MU11 WC1743 CC1407B CC1411B	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLERS INLET ISOLATION LETDOWN STOP THREE-WAY LETDOWN TO RADWASTE DRAIN CWRT 1 INLET FLOW CONTROL CCW FROM CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1472	DID
DH-01	ICS11A ICS11B	MS Line 2 Atmospheric Vent MS Line 1 Atmospheric Vent	Close the valve that spuriously opens with the reach rod for ICS11A or ICS11B.	DB-1130	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
DH-01	MS106 MS107	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation	De-energize and manually align credited steam supply valves to credited AFPT.	DB-1176	DID
DH-01	MS100 MS101 MS100-1 MS101-1	Main Steam Line 2 Isolation (Train 2) Main Steam Line 1 Isolation (Train 1) Main Steam Line 2 MSIV Bypass (Train 2) Main Steam Line 1 MSIV Bypass (Train 1)	De-energize SFRCS to close MSIVs and prevent bypass valves from spuriously opening.	DB-1232	DID
DH-01	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1541	RR
E-01	MS106 MS106A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	De-energize MS106 and manually close. De-energize MS106A and manually close.	DB-1167	RR
E-01	AF3870 AF608 FV6452	Auxiliary Feed Pump 1 to SG 1-2Auxiliary Feedwater to Steam Generator AUX FP 1-1 Solenoid Control Valve	De-energize MS106 and manually close. De-energize MS106A and manually close.	DB-1187	RR
E-01	MS106A ICS38B	Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	De-energize MS106A and manually close.	DB-1538	RR
E-01	MS106 ICS38B	Main Steam Line 1 to AFPT 1 Isolation AFPT 1 Governor	De-energize MS106 and manually close.	DB-1539	DID
E-01	C5762D C5763D PTRC2B3 PTRC2B4	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel RCS Pressure RCS Pressure	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Cooling, Letdown, AND CCW to containment.	DB-1717	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
E-01	FV6452 AF3869	Aux FP 1-1 Solenoid Control Valve Auxiliary Feed Pump 1 to Steam Generator 1-2	De-energize MS106 and manually close. De-energize MS106A and manually close.	DB-1925	RR
EE-01	P56-1 CS1530 P56-2 CS1531	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1218	DID
EE-01	MS100 MS101 MS100-1	Main Steam Line 2 Isolation (Train 2) Main Steam Line 1 Isolation (Train 1) Main Steam Line 2 MSIV Bypass (Train 2)	De-energize SFRCS to close MSIVs and prevent bypass valves from spuriously opening.	DB-1233	DID
EE-01	PS3687A PS3687C PS3689B PS3689D PS3687E PS3687G PS3689F PS3689H	Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS	Trip AFPT-1 locally. Trip AFPT-2 locally. Manually align MDFP to feed the credited S/G.	DB-1243	RR
EE-01	P56-1 CS1530 P56-2 CS1531	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1260	DID
EE-01	CC5095 CC5097 CC1407B CC1411B CC1411A	CCW Line 1 Discharge Isolation CCW Line 1 Return Isolation CCW From Containment Isolation CCW To Containment Isolation CCW To Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1411	RR
EE-01	ICS11A ICS11B	MS Line 2 Atmospheric Vent MS Line 1 Atmospheric Vent	Close the valve that spuriously opens with the reach rod for ICS11A or ICS11B.	DB-1494	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)					
Fire Compartment	**Component ID**	**Component Name**	**Recovery Actions**	**VFDR**	**PCS/ RR/ DID**
EE-01	MS107A MS106	Main Steam Line 1 to AFPT 2 Isolation Main Steam Line 1 to AFPT 1 Isolation	Trip AFPT-1 locally. Trip AFPT-2 locally. Manually align MDFP to feed the credited S/G.	DB-1543	RR
EE-01	MS106A MS107	Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation	Trip AFPT-1 locally. Trip AFPT-2 locally. Manually align MDFP to feed the credited S/G.	DB-1576	DID
EE-01	C133 HV5314 FD1062	LOW VOLTAGE SWITCHGEAR ROOM 2 VENT FAN Low Voltage Switchgear 2 Ventilation Fan 2 Discharge Damper Fire Damper	Provide temporary ventilation to prevent loss of F1 bus.	DB-1609	DID
EE-01	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1656	DID
EE-01	PT2001 PT2002	Containment Pressure Transmitter Containment Pressure Transmitter	Remove control power fuses and stop the containment spray pumps at switchgear. Take local control of credited train components at switchgear. Remove SFAS power to valves at D1P to allow restoration of required components.	DB-1871	RR
EE-01	MS106 MS106A MS107 MS107A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-1 locally. Trip AFPT-2 locally. Manually align MDFP to feed the credited S/G.	DB-1872	RR
EE-01	MS106 MS106A MS107 MS107A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 1 Governor	Trip AFPT-1 locally. Trip AFPT-2 locally. Manually align MDFP to feed the credited S/G.	DB-2006	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
EE-01	MS106 MS106A MS107 MS107A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-1 locally. Trip AFPT-2 locally. Manually align MDFP to feed the credited S/G.	DB-2007	RR
F-01	MS107 MS107A MS5889B ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation Steam Admission to AFPT 2 AFPT 2 Governor	De-energize MS107 and manually close. De-energize MS107A and manually close.	DB-0965	RR
F-01	MS107 ICS38A	Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor	De-energize MS107 and manually close.	DB-0994	DID
F-01	AF3872 AF599 FV6451	Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	De-energize MS107 and manually close. De-energize MS107A and manually close.	DB-1188	RR
F-01	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	De-energize MS107A and manually close.	DB-1531	RR
F-01	C5755D C5756D	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Cooling, Letdown, AND CCW to containment.	DB-1718	RR
F-01	AF3871 AF608 AF3870	Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	De-energize MS107 and manually close. De-energize MS107A and manually close.	DB-1914	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-01	MS106 MS106A MS5889A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Steam Admission to AFPT 1 AFPT 1 Governor	Control AFPT-1 using ICS38B from ASP.	DB-1161	PCS
FF-01	MS106 MS106A MS5889A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Steam Admission to AFPT 1 AFPT 1 Governor	De-energize MS106 and manually open. De-energize MS106A and manually close.	DB-1161	RR
FF-01	MS107 MS107A MS5889B ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation Steam Admission to AFPT 2 AFPT 2 Governor	Trip AFPT-2 locally.	DB-1168	RR
FF-01	MS106 MS106A MS5889A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Steam Admission to AFPT 1 AFPT 1 Governor	Trip AFPT-2 locally.	DB-1181	DID
FF-01	MS106 MS106A MS5889A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Steam Admission to AFPT 1 AFPT 1 Governor	Control AFPT-1 using ICS38B from ASP.	DB-1181	PCS
FF-01	FV6451 FV6452 HIS6403 HIS6404 AF3871 AF608 AF3869 AF3870	Aux FP 1-2 Solenoid Control Valve Aux FP 1-1 Solenoid Control Valve SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Init. AFP2 to SG2 & 1 Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-2 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Control AFPT-1 using ICS38B from ASP.	DB-1189	PCS
FF-01	FV6451 FV6452 HIS6403 HIS6404 AF3871 AF608 AF3869 AF3870	Aux FP 1-2 Solenoid Control Valve Aux FP 1-1 Solenoid Control Valve SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Init. AFP2 to SG2 & 1 Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-2 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Trip AFPT-2 locally. De-energize FV6452. De-energize AF3870 and manually open.	DB-1189	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-01	FV6452 AF3870 AF608 HIS6403 HIS6404	Auxiliary Feed Pump 1-1 Discharge Control Solenoid Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Init. AFP2 to SG2 & 1	Trip AFPT-2 locally. De-energize FV6452. De-energize AF3870 and manually open. De-energize AF608 and manually open.	DB-1200	DID
FF-01	FV6452 AF3870 AF608 HIS6403 HIS6404	Auxiliary Feed Pump 1-1 Discharge Control Solenoid Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 SFRCS Manual Init. AFP1 to SG1 and Isolate SFRCS Manual Init. AFP2 to SG2 & 1	Control AFPT-1 using ICS38B from ASP.	DB-1200	PCS
FF-01	CC1467 CC1495	CCW from Decay Heat Cooler 1 Solenoid CCW to Auxiliary Building Non-essentials	Close CC42.	DB-1208	DID
FF-01	P56-1 CS1530 P56-2 CS1531	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1221	DID
FF-01	C1_41 AC101 AC110 E1	4.16KV Essential Switchgear Bus "C1" DG 1-1 BREAKER Bus Tie C2 BREAKER E1 480V Bus	Procedurally driven actions being taken away from the primary control station to establish power.	DB-1230	DID
FF-01	MS100 MS101 MS100-1 MS101-1	Main Steam Line 2 Isolation (Train 2) Main Steam Line 1 Isolation (Train 1) Main Steam Line 2 MSIV Bypass (Train 2) Main Steam Line 1 MSIV Bypass (Train 1)	De-energize SFRCS to close MSIVs and prevent bypass valves from spuriously opening.	DB-1238	DID
FF-01	PS3687A PS3687C PS3689B PS3689D PS3687E PS3687G PS3689F PS3689H	Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 2 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS Main Steam Line 1 Pressure Low to SFRCS	Verify AFPT-2 tripped. De-energize FV6452. Manually align AFPT-1 to feed the credited S/G.	DB-1244	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-01	ACB34560 ACB34561	Generator Output Breaker Generator Output Breaker	Locally open the main generator output breakers. Identify and respond to adverse plant conditions associated with not automatically tripping the main generator.	DB-1247	DID
FF-01	P56-1 CS1530 P56-2 CS1531	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1262	DID
FF-01	C1-1 SW1356 SW1366	CONTAINMENT AIR COOLER FAN 1 CTMT AIR COOLER 1 OUTLET TEMP CONTROL CONTAINMENT AIR COOLER 1 INLET ISOLATION	Place Containment Air Cooler 1 in service.	DB-1294	DID
FF-01	K5-1	EDG 1	Manually start and load EDG.	DB-1304	DID
FF-01	P3-1 P43-1 AC107 AC113	SW Pump 1-1 CCW Pump 1-1 SW PMP 1-1 BREAKER CC PMP 1-1 BREAKER	Start or verify CC pump in service.	DB-1307	DID
FF-01	MU19 MU66A MU66B MU66C MU66D CC4100 CC4200 CC4300 CC4400 CC5095 CC5096 CC5097 CC5098 CC1407A CC1407B CC1411A CC1411B	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 1-2 Pump Seal Cooler Reactor Coolant Pump 2-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler CCW Line 1 Discharge Isolation CCW Line 2 Discharge Isolation CCW Line 1 Return Isolation CCW Line 2 Return Isolation CCW From Containment Isolation CCW From Containment Isolation CCW to Containment Isolation CCW to Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1386	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-01	RC11 RC2A	PORV Block RC11 Pressurizer Power Relief	Place disconnect switch in LOCAL. Close RC11 at switchgear.	DB-1391	DID
FF-01	IIMU24A MU6420 MU6419 MU6421	RCS Makeup Pump 1 Amps (ammeter) Normal Make-Up Flow Controller Bypass Make-up Alternate injection Throttle Make-up to reactor Coolant Train	Monitor and maintain pressurizer level by manual control of MU6420.	DB-1400	DID
FF-01	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1405	DID
FF-01	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1407	DID
FF-01	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3 MU4 MU11	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN STOP LETDOWN BLOCK ORIFICE ISOLATION THREE-WAY LETDOWN TO RADWASTE DRAIN	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1419	DID
FF-01	DC-PZR-HTR-1 DC-PZR-HTR-2 DC-PZR-HTR-3 DC-PZR-HTR-4 DC-PZR-HTR-ESS-1 DC-PZR-HTR-ESS-2	PZR-HTR-1 PZR-HTR-2 PZR-HTR-3 PZR-HTR-4 PZR-HTR-ESS-1 PZR-HTR-ESS-2	Operate pressurizer heaters power supply breakers at switchgear.	DB-1420	DID
FF-01	AC111 AD111 HP2A HP2B HP2C HP2D	High Pressure Injection Pump 1-1 Breaker High Pressure Injection Pump 1-2 Breaker High Pressure Injection Line 1-1 Isolation High Pressure Injection Line 1-2 Isolation High Pressure Injection Line 1-1 Isolation High Pressure Injection Line 1-2 Isolation	Remove control power fuses and trip AC111 breaker at the switchgear. Remove control power fuses and trip AD111 breaker at the switchgear.	DB-1462	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-01	MU6409 MU6419 MU6420 MU6421 MU6422 MU32 AC105 AD105 MU19 MU66A MU66B MU66C MU66D MU6408	Make-up Pump 1 to Seal Injection Cross Make-up Alternate injection Throttle Normal Make-up Flow Controller Bypass Make-up to reactor Coolant Train Normal Make-up to Reactor Coolant System MAKE-UP FLOW CONTROLLER Make Up Pump 1-1 BREAKER Makeup Pump 1-2 BREAKER Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet MAKE-UP PUMP 2 TO SEAL INJECTION CROSS-X	Remove control power fuses and trip AC105 breaker at the switchgear. Remove control power fuses and trip AD105 breaker at the switchgear.	DB-1480	DID
FF-01	SW1399	TPCW Heat Exchanger Inlet Header Isolation	Manually close SW54. Manually close SW55. Manually close SW56.	DB-1492	DID
FF-01	ICS11A ICS11B	MS Line 2 Atmospheric Vent MS Line 1 Atmospheric Vent	Close the valve that spuriously opens with the reach rod for ICS11A or ICS11B.	DB-1495	DID
FF-01	C5762D C5763D C5755D C5756D PT2000 PT2001 PT2002 PT2003 PTRC2A3 PTRC2A4 PTRC2B3 PTRC2B4	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel Containment Pressure Transmitter Containment Pressure Transmitter Containment Pressure Transmitter Containment Pressure Transmitter RCS Pressure RCS Pressure RCS Pressure RCS Pressure	Remove control power fuses and stop the containment spray pumps at switchgear. Take local control of credited train components at switchgear. Remove SFAS power to valves at D1P to allow restoration of required components.	DB-1497	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-01	ICS38B LISP9A3 PI6365B1 PISP12A1 PISP12B1 SW1382 LIRC14-1 LISP9B3 FI6425	AFPT 1 Governor Steam Generator 1-2 Start-up Level Ind. RC Extended Range Pressure Indicator Steam Generator 1-2 Outlet Steam Pressure Steam Generator 1-1 Outlet Steam Pressure Service Water Supply to Auxiliary Feed Reactor Coolant Pressurizer Channel 1 Level Steam Generator 1-1 Start-Up Level Indic. Makeup Flow Indication	Procedurally driven actions being taken away from the primary control station to maintain plant operations.	DB-1527	DID
FF-01	MS107A MS5889B ICS38A	Main Steam Line 1 to AFPT 2 Isolation Steam Admission to AFPT 2 AFPT 2 Governor	Trip AFPT-2 locally.	DB-1545	RR
FF-01	MS106A MS107 ICS38A ICS38B	Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor AFPT 1 Governor	Trip AFPT-2 locally. De-energize MS106A and manually close.	DB-1578	DID
FF-01	P371 P371B P371D MU6405 MU6407 MU6409 MU6420 MU6422	Make-up Pump 1-1 Main Lube Oil Pump for P37-1 Auxiliary Gear Lube Oil Pump For P37-1 MAKE-UP PUMP 1 RECIRCULATION ISOL-3 WAY MAKE-UP PUMP 1 RECIRCULATION ISOL MAKE-UP PUMP 1 TO SEAL INJECTION CROSS NORMAL MAKE-UP FLOW CONTROLLER BYPASS NORMAL MAKE-UP TO REACTOR COOLANT SYST	Locally start credited Makeup Pump. Locally align credited Makeup Pump auxiliaries. Manually control makeup flow.	DB-1614	DID
FF-01	MU38 MU59A MU59B MU59C MU59D	RCP SEAL RETURN ISOLATION RCP 2-1 Seal Return RCP 2-2 Seal Return RCP 1-1 Seal Return RCP 1-2 Seal Return	Isolate instrument air to MU38 and vent to fail closed.	DB-1622	DID
FF-01	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1677	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-01	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3	Reactor Coolant Letdown Cooler 1 Inlet Letdown Cooler 1 CCW Inlet Reactor Coolant Letdown Cooler 2 Inlet Letdown Cooler 2 CCW Inlet Letdown Coolers Outlet Isolation Letdown Coolers Outlet Isolation Letdown Stop	Isolate instrument air to MU3 and vent to fail closed.	DB-1685	DID
FF-01	HA01 HA03 HB01 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-2-1 RCP 1-1-2	Trip RCP 1-2-2, 1-1-1, 1-2-1 and 1-1-2 breakers at switchgear.	DB-1826	RR
FF-01	C6708 C6709 C6714 C6715 C21-1 FD1018 FD1020 S33-1 SW2927 SV4823A	MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR EMERG SYS SUPPLY FAN FIRE DAMPER FIRE DAMPER CREVS 1 CONDENSING UNIT CONTROL ROOM EMERGENCY CONDENSER 1 TEMP CONTROL ROOM EMERGENCY VENTILATION SYSTEM	Provide temporary ventilation for the MCR.	DB-1828	DID
FF-01	Emergency Trip push button	Emergency Trip push button	Manually trip the turbine using the manual trip pushbutton at the front standard.	DB-1829	DID
FF-01	NI5874C-1 TERC3A6 TERC3B5 TERC4A2 TERC4B3	Nuclear Instrumentation RC LOOP 2 HLG WR TEMP ELEMENT RC LOOP 1 HLG WR TEMP ELEMENT RCP 2-1 DISCH CLG WR TEMP ELEMENT RCP 1-2 DISCH CLG NR TEMP ELEMENT	Locally monitor reactivity and RCS parameters.	DB-1831	DID
FF-01	ABDC1	Bus Tie Xfmer BD	Trip all B bus supply breakers. At C1 bus, disconnect control room from bus breakers.	DB-1832	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
FF-01	DH2735 DH2736	DH Auxiliary Spray Stop DH Auxiliary Spray Throttle	At MCC E11B, place disconnect switch to LOCAL and close DH2735. OR De-energize DH2736 and manually close.	DB-1833	DID
FF-01	AF3869 AF3872 AF599 FV6451	Auxiliary Feed Pump 1 to Steam Generator 1-2 Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Control AFPT-1 using ICS38A from ASP.	DB-2009	PCS
FF-01	AF3869 AF3872 AF599 FV6451	Auxiliary Feed Pump 1 to Steam Generator 1-2 Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-2 locally. Manually close AF599.	DB-2009	RR
FF-02	C6708 C6709 C6714 C6715 C21-1 S33-1 SW2927 SV4823A	MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR EMERG SYS SUPPLY FAN CREVS 1 CONDENSING UNIT CONTROL ROOM EMERGENCY CONDENSER 1 TEMP CONTROL ROOM EMERGENCY VENTILATION SYSTEM	Provide temporary ventilation for the MCR.	DB-1828	DID
FF-03	FD1018 FD1019 FD1020 FD1021	Fire Damper Fire Damper Fire Damper Fire Damper	Provide temporary ventilation for the MCR.	DB-1301	DID
FF-03	C6708 C6709 C6714 C6715 C21-1 S33-1 SW2927 SV4823A	MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR EMERG SYS SUPPLY FAN CREVS 1 CONDENSING UNIT CONTROL ROOM EMERGENCY CONDENSER 1 TEMP CONTROL ROOM EMERGENCY VENTILATION SYSTEM	Provide temporary ventilation for the MCR.	DB-1828	DID
G-01	MS107A	Main Steam Line 1 to AFPT 2 Isolation	De-energize MS107A and manually close.	DB-1916	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
G-02	AC105 AD105 MU6419 MU6421 MU6408 MU6409 MU19 MU66A MU66B MU66C MU66D	MAKE-UP PUMP 1-1 BREAKER MAKE-UP PUMP 1-2 BREAKER MAKE-UP ALTERNATE INJECTION THROTTLE MAKE-UP TO REACTOR COOLANT SYSTEM TRAIN MAKE-UP PUMP 2 TO SEAL INJECTION CROSS-X MAKE-UP PUMP 1 TO SEAL INJECTION CROSS-X Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet	Remove control power fuses and trip AC105 breaker at the switchgear. Remove control power fuses and trip AD105 breaker at the switchgear.	DB-0947	DID
G-02	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3 MU4 MU10A MU11 CC5098 WC1453 WC1747 WC3560	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN STOP LETDOWN BLOCK ORIFICE ISOLATION MIXED BED 1 LETDOWN INLET THREE-WAY LETDOWN TO RADWASTE DRAIN CCW LINE 2 RETURN ISOLATION PRIMARY DEMINERALIZER INLET TEMPERATURE CWRT 2 INLET FLOW CONTROL DEGASIFIER BYPASS FLOW CONTROL	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-0949	DID
G-02	MU38 MU59A MU59B MU59C MU59D	RCP SEAL RETURN ISOLATION RCP 2-1 Seal Return RCP 2-2 Seal Return RCP 1-1 Seal Return RCP 1-2 Seal Return	Isolate instrument air to MU38 and vent to fail closed.	DB-0985	DID
G-02	MS106	Main Steam Line 1 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-0989	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
G-02	MU19 MU66A MU66B MU66C MU66D CC4100 CC4400	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-0990	RR
G-02	MS106 MS106A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1169	RR
G-02	AF3870 FV6452	Auxiliary Feed Pump 1 to SG 1-2 AUX FP 1-1 Solenoid Control Valve	Trip AFPT-1 locally.	DB-1184	RR
G-02	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1217	DID
G-02	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1258	DID
G-02	MS106A	Main Steam Line 2 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-1534	RR
G-02	MS106 MS106A MS107	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation	Locally align system valves to bypass MS107.	DB-1618	DID
G-02	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1678	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
G-02	MU1A CC1409 MU1B CC1410 MU2A MU2B MU3	REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLER 1 CCW INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLER 2 CCW INLET REACTOR COOLANT LETDOWN COOLER 1 INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN STOP	Isolate instrument air to MU3 and vent to fail closed.	DB-1686	DID
G-02	C5762D C5763D C5755D C5756D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Cooling, Letdown, AND CCW to containment.	DB-1711	RR
G-02	AF3869	AFW from AFTP-1 to S/G 1-2	Trip AFPT-1 locally.	DB-1922	RR
HH-01	MS107A	Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-2 locally.	DB-0916	RR
HH-01	C6708 C6709 C6714 C6715 C21-1 FD1018 FD1020 S33-1 SW2927 SV4823A	MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR EMERG SYS SUPPLY FAN FIRE DAMPER FIRE DAMPER CREVS 1 CONDENSING UNIT CONTROL ROOM EMERGENCY CONDENSER 1 TEMP CONTROL ROOM EMERGENCY VENTILATION SYSTEM	Provide temporary ventilation for the MCR.	DB-1828	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
II-01	ACB34560 ACB34561	Generator Output Breaker Generator Output Breaker	Locally open the main generator output breakers. Identify and respond to adverse plant conditions associated with not automatically tripping the main generator.	DB-1248	DID
II-01	HA01 HA03 HB01 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-2-1 RCP 1-1-2	Trip RCP 1-2-2, 1-1-1, 1-2-1 and 1-1-2 breakers at switchgear.	DB-1287	RR
II-01	DC-PZR-HTR-2 DC-PZR-HTR-3	PZR-HTR-2 PZR-HTR-3	Operate pressurizer heaters power supply breakers at switchgear.	DB-1488	DID
II-01	MS106A	Main Steam Line 2 to AFPT 1 Isolation	De-energize MS106A and manually close.	DB-1548	RR
II-01	C5755D C5756D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1714	RR
II-01	FD1060	FIRE DAMPER	Provide temporary ventilation to prevent loss of E1 bus.	DB-1762	DID
II-01	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1771	DID
II-01	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1772	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
II-01	T31-1 T31-2 P112	Condensate Storage Tank (CST) 1-1 Condensate Storage Tank (CST) 1-2 Condenser Polishing Backwash Pump	Locally trip feeder breaker for E3 and F3 busses.	DB-2027	DID
II-04	DC-TURB-TRIP-1 DC-TURB-TRIP-2	DC-TRUB-TRIP-1 DC-TRUB-TRIP-2	Manually trip the turbine using the manual trip pushbutton at the front standard.	DB-1923	DID
J-01	MU3 WC1743	LETDOWN STOP CWRT 1 INLET FLOW CONTROL	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-0899	DID
J-01	MS107 MS107A ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-0900	RR
J-01	AD105 MU6422 MU32 MU6408 MU19 MU66A MU66D	MAKEUP PUMP 1-2 BREAKER NORMAL MAKE-UP TO REACTOR COOLANT SYSTEM MAKE-UP FLOW CONTROLLER MAKE-UP PUMP 2 TO SEAL INJECTION CROSS-X Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet	Remove control power fuses and trip AD105 breaker at the switchgear.	DB-0902	DID
J-01	AF3872 AF599 FV6451	Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-2 locally.	DB-1190	RR
J-01	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1550	RR
J-01	MS106A MS107 ICS38A	Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally. De-energize MS106A and manually close.	DB-1581	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
J-01	C5755D C5756D	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1813	RR
K-01	MS106A ICS38B	Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1538	RR
K-01	MS106 ICS38B	Main Steam Line 1 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1539	DID
K-01	HV5314	LVSGR 2 VENTILATION FAN 2 DISCHARGE DAMPER	Provide temporary ventilation to prevent loss of F1 bus.	DB-1623	DID
K-01	C5755D C5756D	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1710	RR
MA-01	MS106 MS106A MS107 MS107A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-1 locally. OR Trip AFPT-2 locally.	DB-1529	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
MA-01	MS106 MS106A MS107 MS107A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-2 locally (if required).	DB-1565	DID
MA-01	C5762D C5763D C5755D C5756D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Cooling, Letdown, AND CCW to containment.	DB-1719	RR
MA-01	AF3870 AF3872	Auxiliary Feed Pump 1 to SG 1-1 Auxiliary Feed Pump 2 to SG 1-2	Trip AFPT-2 locally (if required).	DB-1879	RR
MA-01	MS106 MS106A MS107 MS107A ICS38A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally (if required).	DB-2003	RR
MB-01	MS106	Main Steam Line 1 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-0989	DID
MB-01	MS106A	Main Steam Line 2 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-1534	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
MB-01	C5762D C5763D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1720	RR
MC-01	MS106	Main Steam Line 1 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-0989	DID
MC-01	ACB34560 ACB34561	Generator Output Breaker Generator Output Breaker	Locally open the main generator output breakers. Identify and respond to adverse plant conditions associated with not automatically tripping the main generator.	DB-1249	DID
MC-01	MS106A	Main Steam Line 2 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-1534	RR
MC-01	C5762D C5763D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1721	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
OS	ACB34560 ACB34561	Generator Output Breaker Generator Output Breaker	Locally open the main generator output breakers. Identify and respond to adverse plant conditions associated with not automatically tripping the main generator.	DB-1250	DID
OS	FD1056 FD1155	Fire Damper Fire Damper	Provide temporary ventilation to prevent loss of E1 bus.	DB-1344	DID
OS	FD1062 FD1154	Fire Damper Fire Damper	Provide temporary ventilation to prevent loss of F1 bus.	DB-1709	DID
OS	C6708 C6709 C6714 C6715 C21-1 S33-1 SW2927 SV4823A	MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR Emergency Vent (Train 1) MCR Emergency Vent (Train 2) MCR EMERG SYS SUPPLY FAN CREVS 1 CONDENSING UNIT CONTROL ROOM EMERGENCY CONDENSER 1 TEMP CONTROL ROOM EMERGENCY VENTILATION SYSTEM	Provide temporary ventilation for the MCR.	DB-1828	DID
P-01	HV5314	LVSGR 2 VENTILATION FAN 2 DISCHARGE DAMPER	Provide temporary ventilation to prevent loss of F1 bus.	DB-1345	DID
P-01	MS106A	Main Steam Line 2 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-1534	RR
P-02	HV5314	LVSGR 2 VENTILATION FAN 2 DISCHARGE DAMPER	Provide temporary ventilation to prevent loss of F1 bus.	DB-1346	DID
P-02	HV5305	LVSGR 1 VENTILATION FAN 1 DISCHARGE DAMPER	Provide temporary ventilation to prevent loss of E1 bus.	DB-1755	DID
P-02	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1775	DID
P-02	AD210	MOTOR DRIVEN FEED PUMP BREAKER	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1776	DID
P-03	HA01 HA03 HB01 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-2-1 RCP 1-1-2	Trip RCP 1-2-2, 1-1-1, 1-2-1 and 1-1-2 breakers at switchgear.	DB-1288	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
P-03	P195-1	EMERG DIESEL GEN FUEL OIL TANK 1-1	Fill EDG Day tank using P8-1.	DB-1340	DID
P-03	HV5314	LVSGR 2 VENTILATION FAN 2 DISCHARGE DAMPER	Provide temporary ventilation to prevent loss of F1 bus.	DB-1347	DID
P-03	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1777	DID
P-03	AD210	MOTOR DRIVEN FEED PUMP BREAKER	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1778	DID
Q-01	MS107 MS107A ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1171	RR
Q-01	AF3872 AF599 FV6451	Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-2 locally.	DB-1192	RR
Q-01	HV5305	LVSGR 1 VENTILATION FAN 1 DISCHARGE DAMPER	Provide temporary ventilation to prevent loss of E1 bus.	DB-1348	DID
Q-01	AD210	Motor Driven Feed Pump Breaker	Locally close manual valve FW6397 or FW6398.	DB-1408	DID
Q-01	AD105 MU6420 MU6422 MU32 MU6408 MU19 MU66A MU66D	MAKE-UP PUMP 1-2 BREAKER NORMAL MAKE-UP FLOW CONTROLLER BYPASS NORMAL MAKE-UP TO REACTOR COOLANT SYST MAKE-UP FLOW CONTROLLER MAKE-UP PUMP 1 TO SEAL INJECTION CROSS-X Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet	Close MU209. OR De-energize and close MU6422.	DB-1481	DID
Q-01	DC-PZR-HTR-ESS-2	PZR-HTR-ESS-2	Operate pressurizer heaters power supply breakers at switchgear.	DB-1489	DID
Q-01	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1556	RR
Q-01	MS106A MS107 ICS38A	Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally. De-energize MS106A and manually close.	DB-1584	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
Q-01	C5755D C5756D	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1722	RR
Q-01	MU1A MU1B MU3 MU11 CC1409	REACTOR COOLANT LETDOWN COOLER 1 INLET REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN STOP THREE-WAY LETDOWN TO RADWASTE DRAIN LETDOWN COOLER 1 CCW INLET	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1729	DID
Q-01	AD210	Motor Driven Feed Pump Breaker	Locally close manual valve FW6397 or FW6398.	DB-1773	DID
Q-01	HA01 HA03 HB01 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-2-1 RCP 1-1-2	De-energize B bus from the switchyard to trip RCP 1-2-1 and 1-1-2. Trip RCP 1-2-2 and 1-1-1 breakers at switchgear.	DB-1868	RR
Q-01	AF3871 AF608 AF3870	Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Trip AFPT-2 locally.	DB-1914	RR
R-01	DC-PZR-HTR-ESS-1 DC-PZR-HTR-ESS-2	PZR-HTR-ESS-1 PZR-HTR-ESS-2	Operate pressurizer heaters power supply breakers at switchgear.	DB-1123	DID
S-01	ACB34560 ACB34561	Generator Output Breaker Generator Output Breaker	Identify and respond to adverse plant conditions associated with not automatically tripping the main generator.	DB-1004	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)					
Fire Compartment	**Component ID**	**Component Name**	**Recovery Actions**	**VFDR**	**PCS/ RR/ DID**
S-01	AD210	MOTOR DRIVEN FEED PUMP BREAKER	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1005	DID
S-01	DC-PZR-HTR-ESS-1	PZR-HTR-ESS-1	Operate pressurizer heaters power supply breakers at switchgear.	DB-1006	DID
S-01	HA01 HA03 HB01 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-2-1 RCP 1-1-2	Trip 13.8KV bus A to stop RCP 1-2-2 and 1-1-1 at supply breaker. Trip RCP 1-2-1 and 1-1-2 breakers at switchgear.	DB-1007	RR
S-01	MS106 MS106A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1009	RR
S-01	AF3870 AF608 FV6452	Auxiliary Feed Pump 1 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-1 Solenoid Control Valve	Trip AFPT-1 locally.	DB-1193	RR
S-01	MS106A ICS38B	Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1557	RR
S-01	MS106 ICS38B	Main Steam Line 1 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1585	RR
S-01	C5762D C5763D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1723	RR
S-01	AD210	Motor Driven Feed Pump Breaker	Remove control power fuses and trip the motor-driven feed pump (MDFP) breaker at the switchgear.	DB-1774	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
T-01	CC5095 CC5097 CC5096 CC5098	CCW Line1 Discharge Isolation CCW Line 1 Return Isolation CCW Line 2 Discharge Isolation CCW Line 2 Return Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1129	RR
U-01	MS106 MS106A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1172	RR
U-01	AF3870 AF608 FV6452	Auxiliary Feed Pump 1 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-1 Solenoid Control Valve	Trip AFPT-1 locally.	DB-1194	RR
U-01	MS101-1	Main Steam Line 1 MSIV Bypass (Train 1)	De-energize SFRCS to prevent MSIV bypass valves from spuriously opening.	DB-1239	DID
U-01	ACB34560 ACB34561	Generator Output Breaker Generator Output Breaker	Identify and respond to adverse plant conditions associated with not automatically tripping the main generator.	DB-1251	DID
U-01	HA01 HA03 HB03	RCP 1-2-2 RCP 1-1-1 RCP 1-1-2	Trip RCP 1-2-2, 1-1-1, 1-2-1 and 1-1-2 breakers at switchgear.	DB-1291	RR
U-01	MU38 MU59A MU59B MU59C MU59D	RCP SEAL RETURN ISOLATION RCP 2-1 Seal Return RCP 2-2 Seal Return RCP 1-1 Seal Return RCP 1-2 Seal Return	Isolate instrument air to MU38 and vent to fail closed.	DB-1299	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
U-01	MU19 MU66A MU66B MU66C MU66D CC4100 CC4200 CC4300 CC4400 CC5096 CC5098 CC1407A CC1411A	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 1-2 Pump Seal Cooler Reactor Coolant Pump 2-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler CCW Line 2 Discharge Isolation CCW Line 2 Return Isolation CCW From Containment Isolation CCW to Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1387	RR
U-01	MU2A MU2B MU3 MU4 MU10A MU11 CC1407A CC1411A CC5096 CC5098 WC1747 WC3560 WC1453	LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION LETDOWN STOP LETDOWN BLOCK ORIFICE ISOLATION MIXED BED 1 LETDOWN INLET THREE-WAY LETDOWN TO RADWASTE DRAIN CCW FROM CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION CCW LINE 2 DISCHARGE ISOLATION CCW LINE 2 RETURN ISOLATION CWRT 2 INLET FLOW CONTROL DEGASIFIER BYPASS FLOW CONTROL PRIMARY DEMINERALIZER INLET TEMPERATURE	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1474	DID
U-01	AC105 MU6419 MU6421 MU6409 MU19 MU66A MU66B MU66C MU66D	MAKE-UP PUMP 1-1 BREAKER MAKE-UP ALTERNATE INJECTION THROTTLE MAKE-UP TO REACTOR COOLANT SYSTEM TRAIN MAKE-UP PUMP 1 TO SEAL INJECTION CROSS-X Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet RCP 1-2-2 Seal Inlet	Remove control power fuses and trip AC105 at the switchgear.	DB-1482	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
U-01	SW1434	CCW HEAT EXCHANGER 2 OUTLET TEMPERATURE	Manually isolate instrument air to SW1434 IA accumulator. Depressurize accumulator to open SW1434.	DB-1490	RR
U-01	MS106A ICS38B	Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1558	RR
U-01	MS106 ICS38B	Main Steam Line 1 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1586	DID
U-01	C5762D C5763D	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1723	RR
U-01	AF3869	AFW from AFTP-1 to S/G 1-2	Trip AFPT-1 locally.	DB-1922	RR
U-01	DC-TURB-TRIP-1 DC-TURB-TRIP-2	DC-TRUB-TRIP-1 DC-TRUB-TRIP-2	Manually trip the turbine using the manual trip pushbutton at the front standard.	DB-1923	DID
UU-01	MS106A ICS38B	Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1538	RR
UU-01	MS106 ICS38B	Main Steam Line 1 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1539	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
UU-01	C5762D C5763D PTRC2B3 PTRC2B4	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel RCS Pressure RCS Pressure	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1724	RR
V-01	HA03 HB03	RCP 1-1-1 RCP 1-1-2	Trip RCP 1-1-1 and 1-1-2 breakers at switchgear.	DB-1120	RR
V-01	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1217	DID
V-01	MS101-1	Main Steam Line 1 MSIV Bypass (Train 1)	De-energize SFRCS to prevent MSIV bypass valves from spuriously opening.	DB-1240	DID
V-01	ACB34560 ACB34561	Generator Output Breaker Generator Output Breaker	Locally open the main generator output breakers. Identify and respond to adverse plant conditions associated with not automatically tripping the main generator.	DB-1252	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
V-01	MU19 MU208 MU66B MU66C CC4100 CC4400 CC1407A CC1407B CC1411A CC1411B	Seal Injection Inlet Isolation Valve Seal Injection Isolation Valve RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet Reactor Coolant Pump 1-1 Pump Seal Cooler Reactor Coolant Pump 2-2 Pump Seal Cooler CCW From Containment Isolation CCW From Containment Isolation CCW to Containment Isolation CCW to Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1388	RR
V-01	MU1B MU2A MU2B MU4 MU10A MU11 CC1407A CC1407B CC1411A CC1411B WC1453 WC1747	REACTOR COOLANT LETDOWN COOLER 2 INLET LETDOWN COOLERS OUTLET ISOLATION LETDOWN COOLERS INLET ISOLATION LETDOWN BLOCK ORIFICE ISOLATION MIXED BED 1 LETDOWN INLET THREE-WAY LETDOWN TO RADWASTE DRAIN CCW FROM CONTAINMENT ISOLATION CCW FROM CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION CCW TO CONTAINMENT ISOLATION PRIMARY DEMINERALIZER INLET TEMPERATURE CWRT 2 INLET FLOW CONTROL	Manually align letdown flow path to Clean Waste Receiver Tank (CWRT).	DB-1475	DID
V-01	MS106A	Main Steam Line 2 to AFPT 1 Isolation	Trip AFPT-1 locally.	DB-1534	RR
V-01	MS106 MS107A	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 1 to AFPT 2 Isolation	Trip AFPT-1 locally. De-energize MCC F11B by opening supply breaker BF1137 to de-energize MS107A then manually close MS107A.	DB-1588	DID
V-01	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1671	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
V-01	C5762D C5763D PTRC2B3 PTRC2B4	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel RCS Pressure RCS Pressure	Prior to battery depletion (1 hour), locally disable auto start for the following: Containment Spray Pumps, Low Pressure Injection Pumps, AND High Pressure Injection Pumps. If lost, re-establish the following: RCP Seal Injection, Letdown, AND CCW to containment.	DB-1724	RR
V-01	AC105	MAKE-UP PUMP 1-1 BREAKER	Remove control power fuses and trip AC105 breaker at the switchgear.	DB-1899	DID
V-01	FV6452 AF3869	Aux FP 1-1 Solenoid Control Valve Auxiliary Feed Pump 1 to Steam Generator 1-2	Trip AFPT-1 locally.	DB-1918	RR
V-01	C5762D C5763D PTRC2B3 PTRC2B4	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel RCS Pressure RCS Pressure	Remove control power fuses and stop the containment spray pumps at switchgear. Take local control of credited train components at switchgear. Remove SFAS power to valves at D1P to allow restoration of required components.	DB-1920	RR
V-01	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Locally trip running containment spray pump. Disable auto start of non-running containment spray pump.	DB-1258	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
X-01	MU19 MU66A MU66D CC5095 CC5097 CC1407B CC1411B	Seal Injection Inlet Isolation Valve RCP 1-1-1 Seal Inlet RCP 1-2-2 Seal Inlet CCW Line 1 Discharge Isolation CCW Line 1 Return Isolation CCW From Containment Isolation CCW to Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-0930	RR
X-01	DC-PZR-HTR-1 DC-PZR-HTR-2 DC-PZR-HTR-3 DC-PZR-HTR-4 DC-PZR-HTR-ESS-2	PZR-HTR-1 PZR-HTR-2 PZR-HTR-3 PZR-HTR-4 PZR-HTR-ESS-2	Trip supply breakers AD1DF11 and AD1DF12 (F1 bus). Operate pressurizer heaters power supply breakers at switchgear.	DB-0932	DID
X-01	HB01 HB03	RCP 1-2-1 RCP 1-1-2	Trip RCP 1-2-1 and 1-1-2 breakers at switchgear.	DB-0935	RR
X-01	MS107 MS107A ICS38A	Main Steam Line 2 to AFPT 2 Isolation Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-0938	RR
X-01	AF3872 AF599 FV6451	Auxiliary Feed Pump 2 to SG 1-2 Auxiliary Feedwater to Steam Generator AUX FP 1-2 Solenoid Control Valve	Trip AFPT-2 locally.	DB-1196	RR
X-01	P56-2 CS1531	Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Manually trip open AD1DF11 and AD1DF12 breakers to de-energize F1 bus.	DB-1227	DID
X-01	P56-2 CS1531	Ctmt Spray Pump 1-2 Ctmt Spray Automatic Control Valve	Manually trip open AD1DF11 and AD1DF12 breakers to de-energize F1 bus.	DB-1268	DID
X-01	MS107A ICS38A	Main Steam Line 1 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-2 locally.	DB-1561	RR
X-01	MS106A MS107 ICS38A	Main Steam Line 2 to AFPT 1 Isolation Main Steam Line 2 to AFPT 2 Isolation AFPT 2 Governor	Trip AFPT-1 locally. De-energize MS106A and manually close.	DB-1589	RR

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
X-01	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1673	DID
X-01	C5755D C5756D PTRC2A3 PTRC2A4	SFAS Channel 2 Logic Panel SFAS Channel 4 Logic Panel RCS Pressure Transmitter RCS Pressure Transmitter	Manually trip open AD1DF11 and AD1DF12 breakers to de-energize F1 bus. Remove control power fuses and trip the containment spray pumps at switchgear. Take local control of credited train components at switchgear. Remove SFAS power to valves at D1P to allow restoration of required components.	DB-1911	RR
X-01	AF3871 AF608 AF3870	Auxiliary Feed Pump 2 to Steam Generator 1-1 Isolate Auxiliary Feedwater to Steam Generator 1-1 Auxiliary Feedwater from AFPT 1-1 to Steam Generator 1-1	Trip AFPT-2 locally.	DB-1914	RR
Y-01	DC-PZR-HTR-1 DC-PZR-HTR-2 DC-PZR-HTR-3 DC-PZR-HTR-ESS-1	PZR-HTR-1 PZR-HTR-2 PZR-HTR-3 PZR-HTR-ESS-1	Trip supply breakers AC1CE11 and AC1CE12 (E1 bus). Operate pressurizer heaters power supply breakers at switchgear.	DB-0997	DID
Y-01	HA01 HA03	RCP 1-2-2 RCP 1-1-1	Trip RCP 1-2-2 and 1-1-1 breakers at switchgear.	DB-0998	RR
Y-01	MS106A ICS38B	Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1000	RR
Y-01	MS106 MS106A ICS38B	Main Steam Line 1 to AFPT 1 Isolation Main Steam Line 2 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1174	RR
Y-01	AF608 FV6452	Auxiliary Feedwater to Steam Generator AUX FP 1-1 Solenoid Control Valve	Trip AFPT-1 locally.	DB-1197	RR
Y-01	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Trip supply breakers AC1CE11 and AC1CE12 (E1 bus).	DB-1217	DID
Y-01	P56-1 CS1530	Ctmt Spray Pump 1-1 Ctmt Spray Automatic Control Valve	Trip supply breakers AC1CE11 and AC1CE12 (E1 bus).	DB-1258	DID

Table G-1 Davis-Besse Recovery Actions and Activities Occurring at the Primary Control Station(s)

Fire Compartment	Component ID	Component Name	Recovery Actions	VFDR	PCS/ RR/ DID
Y-01	MU66B MU66C CC1407A CC1411A	RCP 1-1-2 Seal Inlet RCP 1-2-1 Seal Inlet CCW From Containment Isolation CCW to Containment Isolation	Within 8 hours: Manually align seal injection flow to all RCP seals. OR Manually align CCW flow to all RCP thermal barriers. OR Cooldown RCS to place the plant between 280 and 350 degF.	DB-1366	RR
Y-01	MS106 ICS38B	Main Steam Line 1 to AFPT 1 Isolation AFPT 1 Governor	Trip AFPT-1 locally.	DB-1590	RR
Y-01	RC2 RC10	PRESSURIZER SPRAY VALVE PRESSURIZER SPRAY MOTOR ISOLATION	Trip reactor coolant pumps at the switchgear that cannot be tripped from the control room.	DB-1674	DID
Y-01	C5762D C5763D PTRC2B3 PTRC2B4	SFAS Channel 1 Logic Panel SFAS Channel 3 Logic Panel RCS Pressure Transmitter RCS Pressure Transmitter	Remove control power fuses and stop the containment spray pumps at switchgear. Take local control of credited train components at switchgear. Remove SFAS power to valves at D1P to allow restoration of required components.	DB-1917	RR

H. NFPA 805 Frequently Asked Question Summary Table

2 Pages Attached

Note: The NFPA 805 FAQ process will continue through the transition of non-pilot NFPA 805 plants. Final closure of the FAQs will occur when RG 1.205 is revised to endorse a new revision of NEI 04-02 that incorporates the outstanding FAQs.

This table includes the approved FAQs that have not been incorporated into the current endorsed revision of NEI 04-02 and used in this submittal:

Table H-1 - NEI 04-02 FAQs Utilized in LAR Submittal

No.	Rev.	Title	FAQ Ref.	Closure Memo
06-0008	9	NFPA 805 Fire Protection Engineering Evaluations	ML090560170	ML073380976
06-0022	3	Acceptable Electrical Cable Construction Tests	ML090830220	ML091240278
07-0030	5	Establishing Recovery Actions	ML103090602	ML110070485
07-0032	2	Clarification of 10 CFR 50.48(c), 10 CFR 50.48(a) and GDC 3 Clarification	ML081300697	ML081400292
07-0035	2	Bus Duct Counting Guidance for High Energy Arcing Faults	ML091610189	ML091620572
07-0038	3	Lessons Learned on Multiple Spurious Operations	ML103090608	ML110140242
07-0039	2	Lessons Learned - NEI B-2 Table	ML091420138	ML091320068
07-0040	4	Non-Power Operations Clarification	ML082070249	ML082200528
08-0042	0	Fire Propagation from Electrical Cabinets	ML080230438 ML091460350	ML092110537
08-0043	1	Electrical Cabinet Fire Location	ML083540152 ML091470266	ML092120448
08-0044	0	Large Oil Fires	ML081200099 ML091540179	ML092110516
08-0046	0	Incipient Fire Detection Systems	ML081200120 ML093220197	ML093220426
08-0047	1	Spurious Operation Probability	ML082770662	ML082950750
08-0048	0	Fire Ignition Frequency	ML081200291 ML092180383	ML092190457
08-0049	0	Cable Fires	ML081200309 ML091470242	ML092100274
08-0050	0	Non Suppression Probability	ML081200318 ML092510044	ML092190555
08-0051	0	Hot Short Duration	ML083400188 ML100820346	ML100900052
08-0052	0	Transient Fire Growth Rates and Control Room Non-Suppression	ML081500500 ML091590505	ML092120501

Table H-1 - NEI 04-02 FAQs Utilized in LAR Submittal

No.	Rev.	Title	FAQ Ref.	Closure Memo
08-0053	0	Kerite-FR Cable Failure Thresholds	ML082660021	ML121440155
07-0054*	1	Demonstrating Compliance with Chapter 4 of NFPA 805	ML103510379	ML110140183
09-0056	2	Radioactive Release Transition	ML102810600	ML102920405
09-0057	3	New Shutdown Strategy	ML100330863	ML100960568
10-0059	5	NFPA 805 Monitoring	ML120410589	ML120750108
12-0062	1	UFSAR Content	ML121430035	ML121980557
12-0063	1	Fire Brigade Make-Up	ML121670141	ML121980572
12-0064	1	Hot Work/Transient Fire Frequency Influence Factors	ML122550050	ML12346A488
12-0067	1	Transformer Oil Collection Drain Basin Inspections	ML13035A039	ML13037A425
13-0069	3	Fire Brigade Member Qualification	ML13270A146	ML14210A144

* Note: The FAQ submittal number was 08-0054, but the NRC closure memo for the FAQ was listed as 07-0054. FAQ 07-0054 was used to be consistent with the Closure Memo.

I. Definition of Power Block

3 Pages Attached

The structures in the Owner Controlled Area were evaluated in: (1) Davis-Besse, Unit 1 - Fire Hazard Analysis Report," Revision 25, and (2) C-FP-013.10-007, Revision 4, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning," to meet the NSPC and radioactive release performance criteria described in Section 1.5 of NFPA 805.

For the purposes of establishing the structures included in the DBNPS fire protection program in accordance with 10 CFR 50.48(c) and NFPA 805, DBNPS plant structures listed in Table I-1 are considered to be part of the power block.

Table I-1 – DBNPS Power Block Definition

<table>
<tr><th>Power Block Structures</th><th>Fire Area(s)</th><th>Fire Compartment</th><th>Description</th></tr>
<tr><td rowspan="29">Auxiliary Building</td><td rowspan="8">A</td><td>A-01</td><td>545' Auxiliary Building, Southwest</td></tr>
<tr><td>A-02</td><td>545' Auxiliary Building, Southeast</td></tr>
<tr><td>A-03</td><td>545' Auxiliary Building, Misc. Waste Monitoring Tank Room</td></tr>
<tr><td>A-04</td><td>545' Auxiliary Building, ECCS Pump Room 1-2</td></tr>
<tr><td>A-05</td><td>545' Auxiliary Building, Waste Tank Rooms</td></tr>
<tr><td>A-07</td><td>565' Auxiliary Building, No. 2 Mechanical Penetration Room</td></tr>
<tr><td>A-08</td><td>585' Auxiliary Building, No. 4 Mechanical Penetration Room</td></tr>
<tr><td>A-09</td><td>Auxiliary Building Cable Chases, 115CC and 314CC</td></tr>
<tr><td rowspan="5">AB</td><td>AB-01</td><td>545' Auxiliary Building, No. 1 ECCS Room and DHR Cooler Room</td></tr>
<tr><td>AB-03</td><td>565' Auxiliary Building, No. 1 Mechanical Penetration Room</td></tr>
<tr><td>AB-04</td><td>565' Auxiliary Building, Make Up Pump Room</td></tr>
<tr><td>AB-05</td><td>585' Auxiliary Building, No. 3 Mechanical Penetration Room</td></tr>
<tr><td>AB-06</td><td>Auxiliary Building Stairwell AB-3</td></tr>
<tr><td>AC</td><td>AC-01</td><td>BWST & PWST Pipe Trenches</td></tr>
<tr><td>AD</td><td>AD-01</td><td>Aux Building Elevator Shaft and Stairwell Elev. 545' to 613'</td></tr>
<tr><td>B</td><td>B-01</td><td>Equipment Pipe Chase and Pipe Tunnel</td></tr>
<tr><td>CC</td><td>CC-01</td><td>Old RRA Access and Chemistry Lab Areas</td></tr>
<tr><td>DD</td><td>DD-01</td><td>Cable Spreading Room</td></tr>
<tr><td>DF</td><td>DF-01</td><td>No. 2 Electrical Penetration Room</td></tr>
<tr><td>DG</td><td>DG-01</td><td>No. 1 Electrical Penetration Room</td></tr>
<tr><td>DH</td><td>DH-01</td><td>Main Steam Line Areas</td></tr>
<tr><td>E</td><td>E-01</td><td>No. 1 Auxiliary Feedwater Pump Room</td></tr>
<tr><td>EE</td><td>EE-01</td><td>Auxiliary Building Ventilation Rooms</td></tr>
<tr><td>F</td><td>F-01</td><td>No. 2 Auxiliary Feedwater Pump Room</td></tr>
<tr><td rowspan="3">FF</td><td>FF-01</td><td>Control Room Complex</td></tr>
<tr><td>FF-02</td><td>Control Room Study Room</td></tr>
<tr><td>FF-03</td><td>Control Room Kitchen</td></tr>
<tr><td rowspan="2">G</td><td>G-01</td><td>565' Auxiliary Building, Clean Liquid Waste Monitoring Tank Rooms</td></tr>
<tr><td>G-02</td><td>565' Auxiliary Building, Corridors</td></tr>
</table>

Table I-1 – DBNPS Power Block Definition

Power Block Structures	Fire Area(s)	Fire Compartment	Description
Auxiliary Building	G	G-03	565' Auxiliary Building, SFP Demineralizer and Valve Rooms
	HH	HH-01	Control Room AC Equipment Room and Elevator No. 2
	II	II-09	Non-Radwaste Supply Air and Exhaust Equipment Room
	J	J-01	No. 2 Emergency Diesel Generator Room
		J-02	No. 2 Emergency Diesel Generator Day Tank Room
	K	K-01	No. 1 Emergency Diesel Generator Room
		K-02	No. 1 Emergency Diesel Generator Day Tank Room
	P	P-01	Maintenance Room 320
		P-02	Charge Room 321
		P-03	Passage to Diesel Generator Rooms
	Q	Q-01	High Voltage Switchgear Room B
	R	R-01	Auxiliary Shutdown Panel Room and Duct Chase
	S	S-01	High Voltage Switchgear Room A
	T	T-01	Component Cooling Water Pump Room
	U	U-01	Spent Fuel Pool Pump Room and Mix Tank area
	UU	UU-01	Auxiliary and Turbine Building Stairwell and Elevator Rooms
	V	V-01	Spent Fuel Pool Area
	VA	VA-01	Auxiliary Building Stairwell West – AB-3A
	X	X-01	Low Voltage Switchgear-F Bus and No. 1 Electrical Isolation Rooms
		X-02	Battery Room B
	Y	Y-01	Low Voltage Switchgear-E Bus and No. 2 Electrical Isolation Rooms
		Y-02	Battery Room A
Containment Building	A	A-06	Containment Annulus, East
	AB	AB-02	Containment Annulus, West
	D	D-01	Containment
Emergency Feedwater Facility	EF	EF-01	Emergency Feedwater Facility
Intake Structure	BD	BD-01	Screen Wash Pump Room
	BE	BE-01	Diesel Fire Pump Room and Diesel Fire Pump Day Tank Enclosure
	BF	BF-01	Service Water Pump Room
	BG	BG-01	Service Water Pipe Tunnel and Valve Rooms
Plant Office Building	II	II-04	Maintenance High Bay area
Turbine Building	II	II-01	Turbine Building
	II	II-02	Auxiliary Boiler Room
	II	II-03	Seal Oil Room

Table I-1 – DBNPS Power Block Definition

Power Block Structures	Fire Area(s)	Fire Compartment	Description
Turbine Building	II	II-05	Oil Drum Storage Room
	II	II-06	Condensate Storage Tank Room
	II	II-07	Lube Oil Filter Room
	II	II-08	Turbine Lube Oil Tank Room
Water Treatment Building	BH	BH-01	Water Treatment Building
Outside Area	BM	BM-01	DOST and Pumphouse
	BN	BN-01	Emergency Diesel Generator Week Tanks
	MA	MA-01	Manhole MH3001
	MB	MB-01	Manhole MH3004
	MC	MC-01	Manhole MH3005
	ME	ME-01	Manhole MH3041
	MF	MF-01	Manhole MH3042
	MG	MG-01	Junction Box JB30D4
	MH	MH-01	Manhole MH3009
	OS*	OS-01	Outside Areas, H2 Trailer Park Area, Permanent H2 Area, Personnel Shop Facility, N2 Storage Building, Transformer Area, Switchyard, Borated Water Storage Tank, Emergency Feedwater Storage Tank, Station Blackout Diesel, Relay House, Service Building #2, and Passage Elevator No. 2

* Note: The only portion of the Personnel Shop Facility in the Power Block is the small portion on the first floor where the Station Blackout Diesel Generator cables come out of the duct bank and go into the Turbine Building.

J. Fire Modeling V&V

48 Pages Attached

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Flame Height (Method of Heskestad)	Calculates the vertical extension of the flame region of a fire.	• NUREG-1805, Chapter 3, 2004 • NUREG-1824, Volume 3, 2007 • NUREG-1934, Chapter 2, 2012 • Society of Fire Protection Engineers (SFPE) Handbook of Fire Protection Engineering, 4th Edition, Chapter 2-1, Heskestad, 2008 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA", Revision 3, Sections 5.1, E.1, and E.11	• The correlation is contained in NUREG-1805, for which V&V is documented in NUREG-1824. • The correlation is documented in an authoritative publication of the "SFPE Handbook of Fire Protection Engineering." • The correlation has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934.
Plume Centerline Temperature (Method of Heskestad)	Calculates the vertical separation distance, based on temperature, to a target in order to determine the vertical extent of the zone of influence (ZOI).	• NUREG-1805, Chapter 9, 2004 • NUREG-1824, Volume 3, 2007 • NUREG-1934, Chapter 2, 2012 • SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 2-1, Heskestad, 2008 • NUREG/CR-6850, Volume 2, Appendix H, 2005 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA", Revision 3, Sections 5.2, E.1, and E.10	• The correlation is contained in NUREG-1805, for which V&V is documented in NUREG-1824. • The correlation is documented in an authoritative publication of the "SFPE Handbook of Fire Protection Engineering." • The correlation has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934. • NUREG/CR-6850 generic screening damage criteria are used, which is considered conservative.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Radiant Heat Flux (Point Source Method)	Calculates the horizontal separation distance, based on heat flux, to a target in order to determine the horizontal extent of the ZOI.	• NUREG-1805, Chapter 5. 2004 • NUREG-1824, Volume 3, 2007 • NUREG-1934, Chapter 2, 2012 • SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 3-10, Beyler, C., 2008 • NUREG/CR-6850, Volume 2, Appendix H, 2005 • R1957-0511-0001, “Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA”, Revision 3, Section 5.5 and E.1	• The correlation is contained in NUREG-1805, for which V&V is documented in NUREG-1824. • The correlation is documented in an authoritative publication of the “SFPE Handbook of Fire Protection Engineering.” • The correlation has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934. • NUREG/CR-6850 generic screening damage criteria are used, which is considered conservative.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Plume Radius (Method of Heskestad)	Calculates the horizontal radius, based on temperature, of the plume at a given height. The correlation is derived from the Heskestad centerline plume correlation.	• FIVE-Rev.1, Referenced by EPRI Report 1002981, 2002 • NUREG-1824, Volume 4, 2007 • NUREG-1934, Chapter 2, 2012 • SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 2-1, Heskestad, G., 2008 • NUREG/CR-6850, Volume 2, Appendix H, 2005 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section 5.3 and E.7	• The correlation is contained in the FIVE-Rev.1 fire model, for which V&V is documented in NUREG-1824. • The correlation is documented in an authoritative publication of the "SFPE Handbook of Fire Protection Engineering." • Page 2-7 of the 4th Edition of the SFPE Handbook of Fire Protection Engineering states that the value calculated by this correlation is the point where the temperature has declined to half of the centerline plume temperature. The Heskestad centerline plume correlation is verified and validated in NUREG-1824. • The correlation has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934. • NUREG/CR-6850 generic screening damage criteria are used, which is considered conservative.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Hot Gas Layer (Method of McCaffrey, Quintiere, and Harkleroad (MQH))	Calculates the hot gas layer temperature for a room with natural ventilation.	• NUREG-1805, Chapter 2, 2004 • NUREG-1824, Volume 3, 2007 • NUREG-1934, Chapter 2, 2012 • SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 3-6, Walton W. and Thomas, P., 2008 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Sections 5.6, E.1, and E.8	• The correlation is contained in NUREG-1805, for which V&V is documented in NUREG-1824. • The correlation is documented in an authoritative publication of the "SFPE Handbook of Fire Protection Engineering." • The correlation has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934.
Hot Gas Layer (Method of Beyler)	Calculates the hot gas layer temperature for a closed compartment with no ventilation.	• NUREG-1805, Chapter 2, 2004 • NUREG-1824, Volume 3, 2007 • SFPE Handbook, 4th Edition, Chapter 3-6, Walton W. and Thomas, P., 2008 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA", Revision 3, Sections 5.7, E.1, and E.8	• The correlation is used in the NUREG-1805 fire model, for which V&V was documented in NUREG-1824. • The correlation is documented in an authoritative publication of the SFPE Handbook of Fire Protection Engineering. • The correlation has been applied within the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Ceiling Jet Temperature (Method of Alpert)	Calculates the horizontal separation distance, based on temperature at the ceiling of a room, to a target in order to determine the horizontal extent of the ZOI.	• FIVE-Rev.1, Referenced by EPRI Report 1002981, 2002 • NUREG-1824, Volume 4, 2007 • NUREG-1934, Chapter 2, 2012 • SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 2-2, Alpert, R., 2008 • NUREG/CR-6850, Volume 2, Appendix H, 2005 • R1957-0511-0001, “Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA,” Revision 3, Sections 5.4, E.1, E.3, and E.9.	• The correlation is used in the FIVE-Rev.1 fire model, for which V&V is documented in NUREG-1824. • The correlation is documented in an authoritative publication of the “SFPE Handbook of Fire Protection Engineering.” • The correlation has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934. • NUREG/CR-6850 generic screening damage criteria are used, which is considered conservative.
HGL Calculations using Consolidated Model of Fire Growth and Smoke Transport (CFAST)	Calculates the upper and lower gas layer temperature and interface height.	• NIST Special Publication 1086r1, 2012 • CFAST Version 6 • NUREG-1824, Volume 5, 2007 • NUREG-1934, Chapter 2, 2012 • R1957-0511-0001, “Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA,” Revision 3, Section F.1 and F.2	• V&V of the CFAST code is documented in the NIST Special Publication 1086r1. • The V&V of CFAST specifically for Nuclear Power Plant applications is documented in NUREG-1824. • It is concluded in NUREG-1824, Volume 5, Chapter 6, “Model Validation,” that CFAST models the HGL height, temperature, and smoke concentration in an appropriate manner. • The model has been applied within its limits of applicability and within the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Smoke Detection Actuation Correlation (Method of Heskestad and Delichatsios)	Alpert ceiling jet correlation is used to determine temperature and the Heskestad and Delichatsios temperature to smoke density correlation for smoke detection timing estimates.	• NUREG-1805, Chapter 11, 2004 • NUREG-1824, Volume 4, 2007 • NUREG-1934, Chapter 2, 2012 • SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 4-1, Custer R., Meacham B., and Schifiliti, R., 2008 • SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 2-2, Alpert, R., 2008 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section E.1	• The smoke detection correlation is contained in NUREG-1805. • The temperature to smoke density correlation is documented in an authoritative publication of the "SFPE Handbook of Fire Protection Engineering." • The smoke density correlation has been applied to fire fuels, configurations, and environmental conditions consistent with those described in the SFPE Handbook and NUREG-1805 and has been applied within the limitations described in these publications. • Alpert's ceiling jet correlation V&V is documented in NUREG-1824. Since the Alpert ceiling jet correlation is used to determine the temperature at the detector when using the Heskestad and Delichatsios smoke detection actuation correlation, the normalized parameter range for that correlation applies. Alpert's ceiling jet correlation has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Smoke Detection Actuation Correlation (Method of Heskestad and Delichatsios) (cont.)			• Heskestad and Delichatsios correlated a smoke temperature change of 10°C (18°F) based upon typical fire fuels. The materials tested to develop the Heskestad and Delichatsios smoke detector correlation are representative of the fuels modeled for smoke detector activation. The tested materials include various plastics, foams, and paper, possessing smoke properties similar to the fires modeled at DBNPS. Additionally, when implementing the Heskestad and Delichatsios Smoke Detection Actuation Correlation (i.e. FDT10), the 10°C (18°F) ceiling jet temperature rise from ambient temperature is preserved by adjusting the activation temperature of the smoke detector accordingly.
Sprinkler Activation Correlation	Estimates sprinkler actuation timing based on the Alpert ceiling jet temperature, velocity, and thermal response of sprinkler.	• NUREG-1805, Chapter 10, 2004 • NFPA Fire Protection Handbook, 20th Edition, Chapter 3-9, Budnick, E., Hunt, S., and Wright, M., 2008 • NUREG-1824, Volume 4, 2007 • NUREG-1934, Chapter 2, 20122 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section E.2	• The sprinkler actuation correlation is contained in NUREG-1805. • The correlation is documented in an authoritative publication of the NFPA Fire Protection Handbook. • Alpert's ceiling jet correlation V&V is documented in NUREG-1824. • The correlation has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Control Room Abandonment Calculation using CFAST	Evaluates the time at which Control Room abandonment is necessary based on smoke obscuration and average HGL temperature.	• NIST Special Publication 1086r1, 2012 • CFAST Version 6 • NUREG-1824, Volume 6, 2007 • NUREG/CR-6850, Volume 2, Section 11.5.2.11, 2005 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section F.2	• V&V of the CFAST code is documented in the NIST Special Publication 1086r1. • The V&V of CFAST specifically for Nuclear Power Plant applications is documented in NUREG-1824. • The model has been applied within its limits of applicability. • NUREG/CR-6850 habitability criteria are used, which is considered conservative.
Temperature-Sensitive Equipment Hot Gas Layer Study using CFAST	Determines the temperature and interface height of the upper and lower gas layers for various compartments, for use in assessing damage to temperature sensitive equipment.	• NIST Special Publication 1086r1, 2012 • CFAST Version 6 • NUREG-1824, Volume 5, 2007 • NUREG-1934, Chapter 2, 2012 • NUREG/CR-6850, Volume 2, Appendix H, 2005 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section D.4	• V&V of the CFAST code is documented in the NIST Special Publication 1086r1. • The V&V of CFAST specifically for Nuclear Power Plant applications is documented in NUREG-1824. • The model has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934. • NUREG/CR-6850 generic screening damage criteria are used, which is considered conservative.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Temperature-Sensitive Equipment Zone of Influence Study using FDS	Determines the radiant heat flux ZOI at which temperature-sensitive equipment will reach damage thresholds.	• FDS Version 5 • NIST Special Publication 1018-5, Volume 2, 2010 • NIST Special Publication 1018-5, Volume 3, 2010 • NUREG-1824, Volume 7, 2007 • NUREG-1934, Chapter 2, 2012 • NUREG/CR-6850, Volume 2, Appendix H, 2005 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section C.5.2	• V&V of the FDS is documented in the NIST Special Publication 1018-5. • The V&V of FDS specifically for Nuclear Power Plant applications is documented in NUREG-1824. • The model has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934. • NUREG/CR-6850 generic screening damage criteria are used, which is considered conservative.
Plume/Hot Gas Layer Interaction Study using FDS	Determines the point at which hot gas layer and plume interact and establish limits for plume temperature application.	• FDS Version 5 • NIST Special Publication 1018-5, Volume 2, 2010 • NIST Special Publication 1018-5, Volume 3, 2010 • NUREG-1824, Volume 7, 2007 • NUREG-1934, Chapter 2, 2012 • NUREG/CR-6850, Volume 2, Appendix H, 2005 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section B.4.3	• V&V of the FDS is documented in NIST Special Publication 1018-5. • The V&V of FDS specifically for Nuclear Power Plant applications is documented in NUREG-1824. • The model has been applied within its limits of applicability and the validated range reported in NUREG-1824 or, if applied outside the validated range, the model has been justified as acceptable, either by qualitative analysis, or by quantitative sensitivity analysis. The methodology for justifying application of the fire model outside the range is in accordance with methods documented in NUREG-1934. • NUREG/CR-6850 generic screening damage criteria are used, which is considered conservative.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Correlation for Heat Release Rates (HRR) of Cables (Method of Lee)	Used to correlate bench-scale data to heat release rates from cable tray fires.	• NUREG/CR-6850, Volume 2, Appendix R, 2005 • SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 3-1, Babrauskas, 2008 • National Bureau of Standards Report (NBISR) 85-3195, July 1985 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section E.5	• The correlation is recommended by NUREG/CR-6850. • The correlation is documented in an authoritative publication of the "SFPE Handbook of Fire Protection Engineering." • The correlation has been applied to cable tray arrangements, cable packing densities, and exposure fires consistent with those reported in NBISR 85-3195, or the model has been qualitatively justified as acceptable.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Corner and Wall HRR	Determines a heat release rate adjustment factor for fires that are proximate to a wall or corner.	• SFPE Handbook of Fire Protection Engineering, 4th Edition, Chapter 2-14, Lattimer, 2008 • Zukoski, E.E., "Properties of Fire Plumes," In "*Combustion Fundamentals of Fire*," Cox, G., Ed., Academic Press, London, 1995 • Sargent, W.S., "Natural Convection Flows and Associated Heat Transfer Processes in Room Fires," Ph.D. thesis, California Institute of Technology, Pasadena, CA 1983 • Cetegen, B.M., "Entrainment and Flame Geometry of Fire Plumes," Ph.D. thesis, California Institute of Technology, Pasadena, CA, 1982 • Williamson, R.B. Revenaugh, A. and Mowrer, F.W., "Ignition Sources in Room Fire Tests and Some Implications for Flame Spread Evaluation," International Association of Fire Safety Science, Proceedings of the Third International Symposium, New York, pp. 657-666, 1991 • IMC 0609, Appendix G, "Fire Protection Significance Determination Process," Issue Date 02/28/05 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section E.4 • US NRC Safety Evaluation of Shearon Harris Nuclear Power Plant, Unit 1 related to Issuance of Amendment No. 133 to License No. NPF-63, "Regarding Adoption of National Fire Protection Association Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants", dated June 28, 2010, Attachment C3: Table 3.4-3	• The correlation is documented in an authoritative publication of the "SFPE Handbook of Fire Protection Engineering." • The heat release rate input to plume and ceiling jet correlations is adjusted by using a "location factor" when the fire is located within two feet of a wall or corner. This location factor doubled the heat release rate for both the plume and ceiling jet correlations for a fire near a wall, and quadrupled it for a fire near a corner. • The correlation is documented in recognized Fire Protection Engineering publications. • The correlation is widely accepted and utilized in the industry, for example, it is recommended by IMC 0609 and was approved for use for the NFPA 805 Pilot Plants. • The correlation has been applied within its limits of applicability and in a manner consistent with the referenced studies or has been qualitatively justified as acceptable.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Correlation for Flame Spread over Horizontal Cable Trays (FLASH-CAT)	Predicts the growth and spread of a fire within a vertical stack of horizontal cable trays.	• NUREG/CR-7010, Section 9, 2012 • NUREG/CR-6850, Volume 2, Appendix R, 2005 • R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section E.6	• The correlation is recommended by NUREG/CR-7010 and follows guidance set forth in NUREG/CR-6850. • The FLASH-CAT model is validated in NUREG/CR-7010, Section 9.2.3, through experimentally measured HRRs compared with the predictions of the FLASH-CAT model. • The correlation has been applied to configurations consistent with those reported in NUREG/CR-7010 or the correlation has been qualitatively justified as acceptable.
Pyrosim	Used to create FDS input files.	• R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Section B.4.3.1	• Pyrosim software is a graphical interface used to create FDS input files. • The developers of Pyrosim (Thunderhead Engineering) confirmed that Pyrosim is verified to build the input file correctly. A multi-level process is used to do this, including testing during development and running example problems through the software to ensure the correct input data is written and results obtained. • The software is benchmarked against selected examples from NUREG-1824, "Verification & Validation of Selected Fire Models for Nuclear Power Plant Applications, Volume 7: Fire Dynamics Simulator," to ensure the input is written correctly. • In addition, Pyrosim has been widely used since 2006 and any discrepancies identified by users are addressed in subsequent releases of the software via a software maintenance agreement.

Table J-1 - V & V Basis for Fire Models/Model Correlations Used

Calculation	Application	V & V Basis	Discussion
Engineering Planning and Management (EPM) Fire Modeling Workbook (FMWB)	Used to calculate the zone of influence associated with fire scenarios.	• R1957-0511-0001, "Verification and Validation of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA," Revision 3, Appendix A	• The FMWB is a collection of fire modeling correlations that are already documented in NUREG-1805 FDTs, "Fire Dynamics Tools (FDTs),:Quantitative Fire Hazard Analysis Methods for the US Nuclear Regulatory Commission Fire Protection Inspection Program," December 2004, and Fire Induced Vulnerability Evaluation (FIVE), "EPRI Fire Induced Vulnerability Evaluation Methodology," Revision 1, Referenced by EPRI Report 1002981, 2002. • The fire modeling correlations within the Fire Modeling Workbook (FMWB) have been verified, by "black box" testing, to ensure that the results were identical to the verified and validated models. "Black box" testing (or functional testing) is testing that ignores the internal mechanism of a system or component and focuses solely on the outputs generated in response to selected inputs and execution conditions. • The results from the FMWB were compared to those produced by the NUREG-1805 FDTs and FIVE-Rev1, when identical inputs were entered into both. Since the correlations from NUREG-1805 FDTs and FIVE, Rev1, were verified and validated in NUREG-1824, "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications," Final Report, May 2007, and the results match the results produced by the FMWB, the FMWB is verified and validated with respect to NUREG-1824.

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
High Energy Arcing Faults (HEAFs)	The guidance in Appendix M of NUREG/CR-6850, Vol. 2 was used to determine fire damage due to High Energy Arcing Faults (HEAFs). Fire PRA targets within the initial HEAF Zone-Of-Influence (ZOI) were considered damaged and/or ignited in HEAF scenarios at time zero in accordance with the guidance in NUREG/CR-6850, Section M.4.2. The ensuing cabinet fire occurring after the HEAF event has been modeled as a 211kW fire, with peak heat release rate occurring at time 0 and remaining at peak for a duration of 20 minutes. Decay begins at 20 minutes and also lasts for a duration of 20 minutes. The 40 minute total duration of the subsequent fire scenarios bounds the total recommended timing for electrical cabinet fires in Table G-2 of NUREG/CR-6850. The ensuing fire for oil-filled transformers occurring after the HEAF event has been modeled the same as a 100% oil spill fire. The electrical cabinet heat release rates given in Appendix G of NUREG/CR-6850 are based on fires occurring in one or more cable bundles. The HEAF event is expected to be severe enough to consume interior cable bundles substantially and therefore limit the amount of combustibles available for burning after the HEAF event. Therefore, the lower 211kW value that is based on a fire in a single bundle is considered appropriate. Fire propagation to secondary combustibles in HEAF fire scenarios are modeled as follows: The first overhead cable tray within the ZOI of the HEAF was assumed to be damaged and ignited at time zero, i.e., at the time of the electrical fault. For horizontal cable trays, the cable tray flame spread rate and the heat release rate per unit area (HRRPUA) were determined using methods recommended by NUREG/CR-7010, Volume 1, Section 9.2.2. The total area of the exposed cable trays and combustibles within the ZOI of the HEAF scenario are assumed ignited at time zero. Any remaining trays in a stack ignite consistent with or more conservative than the timing rules in Section R.4.2.2 of NUREG/CR-6850 and NUREG/CR-7010. Fire propagation to adjacent cabinet sections was considered in accordance with NUREG/CR-6850, Appendix S. Unless precluded by cabinet design, spread to adjacent cabinet sections was assumed to occur at 10 minutes. In the majority of fire scenarios, the adjacent electrical cabinet section is vented at the top. Therefore, an internal hot gas layer plenum in the cabinet is not postulated and fire spread between adjacent vertical sections of the cabinet is assumed not to occur.	• NUREG/CR-6850, Volume 2, Appendix M, R, and S, 2005 • Supplement 1 to NUREG/CR-6850, Section 7, 2010 • NUREG/CR-7010, Section 9.2.2, 2012

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
Treatment of Cable Trays with a Mixture of Cable Materials	A review of cable insulation and jacket materials was performed at DBNPS Nuclear Power Station (DBNPS) to determine the type (i.e., thermoset, Kerite FR or thermoplastic) of cables installed at DBNPS in order to estimate the appropriate cable time to damage/ignition, heat release rate per unit area (HRRPUA), and flame spread rate. When information regarding the insulation or jacket material was not readily available, the cable was conservatively considered thermoplastic. In all cases, where the cable material review indicated any Kerite FR or thermoplastic cables were present, the cable raceway (i.e. cable tray) was conservatively assumed to be Kerite FR or thermoplastic when determining the time to damage/ignition, HRRPUA and spread rate. No mass weighted average approach was used for cable tray HRRPUAs as recommended in NUREG/CR-7010. The recommendations of NUREG/CR-7010 allow for the flame spread rate of the predominant cable type to be used for trays with a mixture of thermoplastic and thermoset cables. However, DBNPS did not utilize this approach. Instead, DBNPS conservatively treated trays containing any thermoplastic cable as thermoplastic raceways for the purpose of flame spread rate. Per the guidance within NUREG/CR-7102 and NFPA FAQ 08-0053, it is permissible to treat Kerite FR cables as thermoset, since both the jacket and insulation are thermoset, for fire growth and spread.	• NUREG/CR-6850, Volume 2, Appendix R, 2005 • CR 10-74188, 2010 • NUREG/CR-7010, Section 9.2.2. 2012 • NUREG/CR-7102, 2011 • NFPA FAQ 08-0053, 2012

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
Secondary Combustible Treatment	Detailed fire modeling calculations to determine time to ignition of secondary combustibles and subsequent flame spread and fire propagation were performed consistent with the processes recommended by NUREG/CR-6850 and NUREG/CR-7010. The ignition criteria for thermoset and thermoplastic cables provided in NUREG/CR-6850, Appendix H, Table H-1, was used for estimating ignition time for the 1st tray in the stack. The ignition temperature criteria for Kerite FR cables was based on the information in Sandia National Laboratories report SAND2010-4936, which represented the most current information on Kerite FR insulated cables at the time the analysis was performed. The ignition heat flux criteria for Kerite FR cables was conservatively assumed to be the same as thermoplastic cables due to the lack of information available. The time to ignition of a horizontal stack of cable trays was determined by calculating the critical HRR needed to damage the first (closest) cable tray in the stack. The critical HRR was determined using FDT 09 or FDT 05.1 and the HRR was manipulated until the temperature or heat flux at the tray location reached the damage criteria. Cable trays were assumed to ignite when the fire reached the critical HRR for damage, or if the cable tray was located within the flame, with no additional consideration of thermal response. Cables in conduit were not considered to contribute to fire growth or spread. To calculate the burning area, the entire width of the cable tray was assumed to ignite. The length of the tray assumed to initially ignite was determined by the length of the tray exposed to the fire. In accordance with NUREG/CR-6850, Section R.4.2, the burning area for horizontal cable trays in a stack was determined using the empirical model for upward flame propagation assuming the angle of horizontal spread from tray level to tray level is 35 degrees to either side. NUREG/CR-6850, Appendix R provides cable tray properties and guidance on determining the HRRPUA and spread rate for both thermoset and thermoplastic cable trays. For most areas, DBNPS fire modeling analyses use the NUREG/CR-6850 spread rates and the most conservative NUREG/CR-6850 Table R-1 bench scale HRRPUAs (adjusted using the Lee correlation, shown in the table below) for each cable type in the fire growth analysis for cable trays. For some risk-significant fire scenarios, subsequent fire modeling refinements utilize the refined HRRPUAs recommended by NUREG/CR-7010. After the first cable tray in a stack of horizontal thermoplastic cable trays was assumed to ignite, the propagation of fire within the stack was assumed to occur at a rate of one tray per minute. If there was a second stack of cable trays adjacent to the first stack, spread to the first (lowest) tray in the second stack was assumed to occur one minute after ignition of the first tray in the first stack. For thermoset and Kerite FR cable tray stacks, propagation of fire within the stack follows the timing outlined in NUREG/CR-6850, Section R.4.2.2. Only fire propagation to stacks immediately adjacent to the source was modeled, in accordance with NFPA FAQ 08-0049.	• NUREG/CR-6850, Volume 2, Appendix H and R, 2005 • NUREG/CR-7010, Section 9.2.2 and 10, 2012 • NFPA FAQ 08-0049, 2009 • SAND2010-4936, 2010

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
Secondary Combustible Treatment (cont.)	Non-cable secondary combustibles (e.g., plastic, paper, wood, etc.) were identified during plant walkdowns. Small combustible items, such as small plastic signs, fiberglass ladders, plastic telephones, etc., were typically screened as negligible in terms of the fire growth analysis for fire scenarios, as the size or location of the combustibles were judged to not significantly increase the ZOI of the fire scenarios. If fire propagation to non-cable secondary combustibles was possible, they were included in the ignition source fire growth analysis.	
Cabinet Door Condition	Administrative controls are in place to minimize the likelihood of fires involving cabinets with doors that may remain open during maintenance or measurement activities in the plant. These administrative controls include compliance with applicable industrial/electrical safety requirements, prevention of foreign material from entering the maintenance area, and proper housekeeping practices related to fire prevention and protection of the equipment. Procedurally, if maintenance or measurement activities can be performed while the cabinet is not energized, efforts are made to ensure that electrical equipment is de-energized prior to performing these activities, rendering the cabinet as a non-credible ignition source. Plant administrative procedures require that periodic inspections be performed to ensure electrical component doors and hardware are intact and that enclosure covers are not open, missing, or not secure. Maintenance logs are kept to ensure equipment is returned to the "As-Found" configuration at the completion of maintenance. Based on plant procedures, electrical cabinet doors are unlikely to be left open when maintenance or measurement activities are not in progress. Cabinet doors may be temporarily open; however, administrative procedures provide reasonable assurance that the likelihood of a fire in these cabinets is minimal. Therefore, the fire modeling analysis assumes that all electrical cabinets with normally closed doors are maintained closed.	• NOP-OP-1012, Revision 7 • NOP-WM-0001, Revision 9
440V Cabinet Treatment	Fire propagation from well-sealed and robustly secured Motor Control Centers (MCCs) with voltages of 440V or greater have been modeled using the methodology found in FPRA FAQ 14-0009. Any well-sealed and robustly secured electrical cabinets that are not MCCs, but do house circuits of 440V or greater, are evaluated for fire propagation beyond the ignition source consistent with the guidance in NUREG/CR-6850.	• NUREG/CR-6850, Volume 2, Section 6, 2005 • FPRA FAQ 14-0009

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
Transient Fire Placement	Transient fires have been postulated in each fire compartment in the Fire PRA. All accessible floor area is postulated as a possible transient ignition source location. Each fire compartment has been subdivided into one or more transient fire zones (weighted by floor area), to refine the frequency of damage to risk significant targets. The total transient and hot work ignition frequency for each compartment is apportioned to each transient scenario using a geometric factor (i.e., floor area ratio). A “pinch point” focused approach is not utilized. By analyzing transient fires for all accessible floor areas within fire compartments, all potential pinch point locations were considered for damage. The boundaries of each transient scenario are chosen such that the associated fire growth and resulting damage to PRA targets (i.e., cables and equipment) can be represented by a common bounding fire scenario (i.e., including or excluding secondary combustibles). In order to keep the number of locations (and therefore the number of transient scenarios) requiring separate analysis to a minimum, locations with similar Fire PRA targets may be grouped into larger transient scenarios. The remainder of the floor space of the fire compartment is subdivided as necessary to distinguish between different fire growth potential (e.g., locations where secondary combustibles are at a low enough elevation to be ignited by the transient fire) and Fire PRA targets. In some cases this leaves a section of the floor area with no fire growth potential beyond the initial transient source and no targets within the ZOI, creating a transient scenario with no target damage. This process ensures that all accessible floor area is accounted for in the transient analysis. Target damage sets for a transient fire zone are not limited to the targets within the designated floor area boundary, but are based on the ZOI of the transient when placed anywhere within the transient floor area, including the border. The result is that multiple transient fire scenarios may damage common targets, since they may have overlapping zones of influence. Transient and hot work fires were not postulated in locations within fire compartments that were considered inaccessible. Inaccessible areas are defined as follows: • An area that is impossible to access because it is occupied by permanent fixtures such as plant equipment, structural features, piping, and cable trays. These permanent fixtures either occupy the floor space entirely or are sufficiently low to the floor (i.e., 2 feet or less), so as to obstruct the placement of transient material. • An area where access is prohibited or extremely difficult due to the presence of a permanent fixture (as defined above) and there is no credible reason to expect transient material to accumulate (e.g., areas on top of half height rooms, confined areas behind a floor to ceiling stack of cable trays with no expected reason for access).	• NUREG/CR-6850, Volume 2, Section 6 and 11, 2005

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
Justification for Reduced Transient HRRs	Reduced HRR for transient fires are credited in the following fire compartments: • BF-01, "Service Water Pump Room" – (142 kW) • BG-01, "Service Water Valve Room" – (142 kW) • D-01, "Containment" – (69 kW) The guidance provided in the June 21, 2012, memo from Joseph Giitter to Biff Bradley ("Recent Fire PRA Methods review Panel Decisions and EPRI 1022993, 'Evaluation of Peak Heat Release Rates in Electrical Cabinets Fires'," ADAMS Accession No. ML12171A583) allows the user to choose a lower screening heat release rate for transient fires in a fire compartment based on "the specific attributes and considerations applicable to that location." The guidance indicates that "plant administrative controls should be considered in the appropriate HRR for a postulated transient fire" and that "a lower screening HRR can be used for individual plant specific locations if the 317 kW value is judged to be unrealistic given the specific attributes and considerations applicable to that location." Walkdowns were performed and the room usage/contents were considered when prescribing the transient HRR. This provided assurance that the HRRs used for the transient scenarios, modeled in the Fire PRA, would be appropriate representation of any potential transient fire in the area. All areas where a reduced transient HRR is utilized are regulated by the Davis-Besse transient control program. The combination of transient controls and expected room usage/contents allow for an appropriate reduced transient HRR to be selected as follows. In Fire Compartments BF-01 and BG-01, the 75th percentile transient HRR (142 kW) was used for the transient fire scenarios. The HRR is reduced in these fire compartments for fire scenarios based on the following criteria: • Large combustible liquid fires are not expected in the areas represented by the reduced HRR transient fire scenarios. A review of work history for Fire Compartments BF-01 and BG-01 showed that there would be no introduction of combustible liquids into the area. • The materials composing the fuel packages included in Table G-7 of NUREG/CR-6850 are not representative of the typical materials expected to be located in these areas. Untreated wood (typically prohibited at Nuclear Power Plants), airline trash bags with over 2 kg of paper products or over 4 kg of straw/grass/eucalyptus duff are unlikely to be present in BF-01 or BG-01. Since fires that are not bounded by the tests are not expected to occur in Fire Compartments BF-01 or BG-01, the 75th HRR was deemed appropriate for use. In Fire Compartment D-01 a 69 kW transient HRR was used for all transient fires. In addition to the justification provided above, a transient HRR may be further refined to 69 kW for this fire compartment based on the following criteria:	• Memo from Joseph Giitter to Biff Bradley, June 21, 2012 • DB-FP-00007, Rev. 13, 2014

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
	• Fire Compartment D-01 is the Reactor Containment building, which is a locked, high radiation area during power generation. All transient combustible materials are confirmed to be removed from the area before returning to power. • Large transient combustible liquid fires are not expected in the compartment since at power activities do not include maintenance of oil containing equipment. • A transient fire in an area of strict combustible controls, where only small amounts of contained trash are considered possible, is judged to be no larger than the 75th percentile fire in an electrical cabinet with one bundle of qualified cable. • A review of the transient ignition source tests in Table G-7 of NUREG/CR-6850 indicates that of the type of transient fires that can be expected in this compartment (i.e., polyethylene trash can or bucket containing rags and paper) were measured at peak heat release rates of 50 kW or below. Access to Fire Compartments BF-01, BG-01, and D-01 is strictly controlled. These areas are all within the power block, and thus access is restricted to those with unescorted access authorization. While there is regular access to Fire Compartments BF-01 and BG-01, they are not in a normal travel path, so traffic is limited to operators and engineers on walkdowns, maintenance personnel, etc. Fire Compartment D-01 is a locked, high radiation area during power generation and access is generally prohibited except during an outage. Procedure DB-FP-00007, “Control of Transient Combustibles,” states that transient Combustible Permits (TCPs) SHALL be obtained prior to taking any transient combustible or flammable materials into Fire Compartment D-01, and for all wood scaffolding or combustible liquids greater than one gallon in Fire Compartment BF-01 and BG-01, which allows for any necessary maintenance activities to be conducted with appropriate compensatory measures in place, as determined by the Site Fire Marshal. This ensures proper notification to the Site Fire Marshal and Maintenance Supervisor by maintenance personnel and work planners of additional hazards and the duration for which this hazard exists to enable a prompt response in the event of an incident during maintenance. Typical ignition source maintenance activities include, but are not limited to, cleaning, inspecting, and repairing equipment. The types and quantities of combustibles that may be introduced to perform these maintenance activities consist of limited amounts of testing wires, cable insulation, various test meters, plastic service carts, mixed plastic/rubber and metal tools, small tables, and chairs. The transient combustible permits for these activities have been reviewed by fire protection and found to be acceptable with no additional compensatory actions. Large combustible liquid fires are not expected in areas with a reduced transient HRR since transient combustible permits need to be obtained prior to taking any significant quantity of combustible liquid into the areas.	

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
	Therefore, based on administrative controls, location-specific attributes and considerations, required maintenance activities and materials, and expected personnel traffic, reduced HRRs are justified in all or portions of Fire Compartments BF-01, BG-01, and D-01, as necessary. Condition reports (CRs) dated between 2/20/2010 and 4/20/2015 identifying violations of hot work or transient combustible controls were reviewed. The review did not find any hot work or transient combustible control violations in Fire Compartments BF-01, BG-01 or D-01. Therefore, the current controls are sufficient to ensure the bases outlined above are not violated. Reducing the transient HRR, where reasonable and justifiable, allows for a more realistic transient fire ZOI. The reduced ZOI, for the applicable transient fire scenarios, results in fewer secondary combustibles involved and a smaller Fire PRA target damage set. This ultimately provides for a more realistic CDF/LERF for the transient scenarios and respective fire compartments.	
Transient Fire Growth Rate	When utilizing the t^2 fire growth profile for transient scenarios, the guidance contained in NUREG/CR-6850, Supplement 1, Chapter 17, was used to determine the time to peak HRR of a transient fire. Chapter 17 states that a time dependent fire growth model is appropriate for any situation where the basis of its use can be established. Three categories of transient growth profiles are provided with their respective times to peak heat release rate: • Common trash can fire (8 minutes). • Common trash bag fire (2 minutes). • Spilled solvents/combustible liquids (0 minutes). The profile that was selected for each transient ignition source was based on administrative controls and the expected contents within the compartment.	• Supplement 1 to NUREG/CR-6850, Chapter 17, 2010 • C-FP-013.10-034, Rev. 2, 2015

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
Determination of Vent Dimensions for MQH HGL Calculations	The method of MQH used for estimating the HGL temperatures utilized a 3' x 7' door opening in all fire compartments that do not assume whole room damage for the fire scenarios except for A-05 which uses a 3.4' x 6.7' opening and G-01 which uses a 3.9' x 6.1' opening which are the measured dimensions of the doorways in those areas. Plant walkdowns were conducted for each fire compartment to confirm that there was a door with dimensions of at least this size. Once the fire is detected, fire brigade personnel will be dispatched to the room and are expected to open a door and perform suppression activities, which would provide the door opening assumed in the fire modeling analysis. Prior to this action, and in the early stages of the fire scenarios, a single door opening is considered an appropriate representation of the various natural ventilation openings within the room (e.g., door gaps, HVAC ventilation openings, etc.). This single door opening is representative of the plant conditions and is conservative since most compartments have more than one door and have other natural and mechanical ventilation openings.	• Detailed Fire Modeling Calculations
Use of MQH Correlation with Vents in the Floor or Ceiling	When the algebraic models were implemented for HGL calculations using the method of MQH, all vents in the floor or celling, or in a wall at or near the ceiling of the compartment were represented by a single door opening. In certain cases where the only ventilation opening was located at the ceiling (i.e., E-01 and F-01), the Beyler closed compartment correlation was used for the HGL calculations. Vents in the floor or celling and vents at or near ceilings were evaluated by walkdowns on a fire compartment by fire compartment basis and in all cases were omitted from the HGL calculation. This is considered conservative because the inclusion of these vents would result in additional room cooling and therefore lower predicted HGL temperatures.	• Detailed Fire Modeling Calculations
Treatment of Junction Box Fires	Junction boxes have been modeled using the methodology found in FPRA FAQ 13-0006. The junction box with the highest calculated CCDP in a given fire compartment has been applied to the junction box ignition frequency for that compartment.	• FPRA FAQ 13-0006
Treatment of Welding and Cutting Cable Fires	Cable fires caused by welding and cutting have been modeled using the methodology found in FPRA FAQ 13-0005. The cable tray with the highest calculated CCDP in a given fire compartment has been applied to the cable fires caused by welding and cutting ignition frequency for that compartment.	• FPRA FAQ 13-0005
Treatment of Self-Ignited Cable Fires	Self-ignited cable fires have been modeled using the methodology found in FPRA FAQ 13-0005. Self-ignited cable fires are postulated for unqualified power cables only. Since Davis-Besse power cable are qualified, thermoset type cables, self-ignited cable fires are screened as non-damaging ignition sources.	• FPRA FAQ 13-0005 • CR 10-74188, 2010

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
Detection and Suppression Actuation Time Determination	Detection timing, for both smoke and heat detectors, was determined using NUREG-1805 FDT 10 *Estimating Detector Response Time*. Using the physical parameters (radial distance from fire source to detector, height of ceiling above the fire source, and ambient temperature) required for each fire scenario, the minimum fire size required to activate the detector was determined. If the minimum HRR required to activate the detector was less than the critical HRR evaluated for target damage, then detection may have been credited. In these cases, the time to detection was determined by using a standard t^2 fire growth profile, calculated for each detailed fire scenario. The delay to detector activation, as calculated by FDT10, was omitted for t^2 fire growth profiles. The time to suppression activation is dependent on the type of system under evaluation. For those systems requiring activation of a bulb or link (i.e., wet-pipe or pre-action systems), the sprinkler response time was determined using NUREG-1805 FDT10 *Estimating Sprinkler Response Time*. The process of comparing critical HRRs of sprinkler activation versus target damage is similar to determining detector response times. Using the physical parameters (height of ceiling above the fuel source, radial distance to the sprinkler head, ambient temperature, sprinkler Response Time Index (RTI), and activation temperature of the sprinkler) required for each fire scenario, the minimum fire size required to activate the sprinkler was determined. If the minimum HRR required to activate the sprinkler head was less than the critical HRR evaluated for target damage, then suppression may have been credited. In these cases, the time to suppression was determined by using a standard t^2 fire growth profile, calculated for each detailed fire scenario. The delay to sprinkler activation, as calculated by FDT10, was omitted for t^2 fire growth profiles. The FDT10 activation time assumes exposure to a steady HRR from time zero, with no regard for fire growth. Using a t^2 fire growth profile, the thermal response of the detector activation is considered to be accounted for, as the fire grows due to heat/smoke exposure. Therefore no additional delay is considered necessary.	• NUREG-1805, Chapter 10, 11 and 12, 2004

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
Main Control Room (MCR) Volume	A single compartment was programmed into the CFAST model representing the contiguous open volumes between the Control Cabinet Room and Control Room. One large compartment characterizes the Control Room and Control Cabinet Room and the ceiling height was assumed to be the lower of the two suspended acoustic tile ceiling heights of the rooms. The suspended acoustic ceiling tile was conservatively assumed to form a significant barrier capable of facilitating the accumulation of smoke and hot gases; therefore, this suspended ceiling represented the ceiling boundary for the MCR abandonment analysis. Plant equipment drawings were used to estimate the volume of the main control boards (MCBs) and electrical cabinets in the Control Room and Control Cabinet Room. The compartment volume was reduced by the volume of the MCBs and electrical cabinets housed within the compartment. This was done by subtracting the volume of the MCBs and electrical cabinets from the gross volume of the Control Room and Control Cabinet Room and then dividing the remaining volume by the ceiling height. The length and width of the compartment were calculated by taking the square root of the quotient area.	• C-FP-013.10-034, Rev. 2, 2015
MCR Transient Fire HRR	The majority of transient fires involving combustibles within the area were determined to be bound by the Case 8, discretized heat release rate distribution presented in Table E-9 (Case 8 – Transients) of NUREG/CR-6850 (i.e., 98th percentile of 317 kW). There are certain areas in the Control Room that were identified to have the potential for a larger transient HRR (i.e., Shift Supervisors Office, bookshelves with binders, and a plastic cart). Therefore, transient fires in these areas utilized a 1000 kW HRR, without a discretized distribution (i.e., a single severity factor of 1.0 was used). In order to apportion the results of the different transient scenarios in the analysis, a geometrical weighting factor that is applicable to each scenario was determined. The weighting factor for transient scenarios was calculated based on a floor area ratio to determine the fraction of transient fires that utilize the Case 8 HRR distribution and the fraction of transient fires that utilize the increased 1000 kW HRR. The total area was based on the area of the Control Room, the Control Cabinet Room and the Shift Supervisors Office. The area of the transient fires that utilize the 1000 kW HRR was determined by calculating the area around certain combustibles in the MCR (i.e., plastic carts, book shelves with binders and the Shift Supervisors Office) that were identified during walkdowns.	• C-FP-013.10-034, Rev. 2, 2015 • NUREG/CR-6850, Volume 2, Appendix E, 2005

Table J-2 - Technical Basis for Fire Modeling Approaches and Methodologies

Method/Approach	Description of Method	Basis Document(s)
MCR Cabinet Fire HRR	The ignition sources for Fire Compartment FF-01 include the main control board and various electrical cabinets. All of the electrical cabinets and the MCB sections are ventilated, closed door cabinets containing single and multiple qualified cable bundles. A review of the cable types in the MCBs determined that all unshielded board control and power circuit wiring is specified to be cross-linked polyethylene which is a qualified type cable therefore, the analyzed heat release rates used are those presented in Table E-2 (Case 1 – vertical cabinets with qualified cable, single cable bundle) or Table E-3 (Case 2 – vertical cabinets with qualified cable, multiple cable bundle) in Appendix E of NUREG/CR-6850.	• C-FP-013.10-034, Rev. 2, 2015 • NUREG/CR-6850, Volume 2, Appendix E, 2005 • Specification 7749-M-320
MCR Secondary Combustibles	Many electrical cabinets within the Control Room and Control Cabinet Room contain multiple vertical sections. Fire propagation to adjacent vertical section generally occurs in 10 to 15 minutes, depending on the cable configurations within the electrical cabinets, per Appendix S of NUREG/CR-6850. The electrical cabinet fires were conservatively assumed to spread to two additional vertical sections at 10 minutes (at this time three electrical cabinet sections are burning). Each of the two adjacent vertical sections grows to the peak heat release rate prescribed for the specific Bin being analyzed and follows the same fire growth profile as the initial fire. There are no exposed cable trays within the MCR and fire spread beyond the primary ignition source and adjacent vertical sections is not expected.	• C-FP-013.10-034, Rev. 2, 2015 • NUREG/CR-6850, Volume 2, Appendix S, 2005

Table J-3 - Technical Basis for Damage Thresholds used in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
Cable Characterization in Power Block	NUREG/CR-6850, Appendix H, provides damage and ignition criteria for both thermoset and thermoplastic cables that are typically found in nuclear power plants. Specifically, Table H-1 provides both the radiant heat and temperature damage criteria for both types of cables. A review of cable types was performed at DBNPS using cable specifications to determine the type (thermoset, Kerite FR or thermoplastic) of cables installed in the plant for use in determining the appropriate thermal damage threshold for fire modeling purposes. When information regarding the insulation or jacket material was not readily available, the cable was conservatively considered thermoplastic. Raceways and conduits that contain a mixture of cable material types used the more conservative cable damage and ignition criteria (i.e., HRR, fire spread, and damage threshold). Per Appendix H of NUREG/CR-6850, the following thermal damage criteria has been used for raceways and conduits containing any amount of unknown or thermoplastic cables: Critical Temperature: 205°C (400°F) Critical Heat Flux: 6kW/m² (0.5 BTU/ft²s) For raceways and conduits known to contain only thermoset cables, the following damage criteria have been used: Critical Temperature: 330°C (625°F) Critical Heat Flux: 11 kW/m² (1.0 BTU/ft²s) DBNPS raceways also contain cables with Kerite FR jacketing. These cables are provided with either Kerite HT or Kerite FR insulation. Per the guidance within NUREG/CR-7102 and NFPA 805 FAQ 08-0053, it is permissible to treat these cables as thermoset, since both the jacket and insulation are thermoset, for fire growth and spread. FAQ 08-0053 also recommends that a temperature of 247°C be assumed as the minimum threshold of electrical failure for Kerite FR cables. Based on this, Kerite FR has been treated as thermoset material with respect to flame spread. Since the analysis was performed before the closure of FAQ 08-0053, the current fire models use a damaging temperature threshold of 250°C. This damage threshold was taken from Sandia National Laboratories report SAND2010-4936, which represented the most current information on Kerite FR insulated cables at the time that the analysis was performed. The resulting increase in plume ZOI after reducing the damage threshold by 3°C is less than 1”. Targets located at or just beyond the plume ZOI have already been assumed failed in fire scenarios in order to account for measurement uncertainty, negating the impact of extending the ZOI by 1”. In addition, the maximum increase in severity factor, after reducing the Kerite damage threshold by 3°C, is less than 1% and is considered insignificant. Because neither NUREG/CR-7102 nor FAQ 08-0053 contain information on a damaging heat flux value, the thermoplastic damaging heat flux threshold has conservatively been used.	• NUREG/CR-6850, Volume 2, Appendix H, 2005 • SAND2010-4936, 2010 • NUREG/CR-7010, Section 9.2.2. 2012 • NFPA 805 FAQ 08-0053

Table J-3 - Technical Basis for Damage Thresholds used in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
Credit for Cable Tray Covers, Kaowool, Electrical Raceway Fire Barrier System (ERFBS), and Embedded Conduit Credit	The majority of cable trays at DBNPS are provided with solid bottom covers and sides, with Kaowool insulation covering the top. It is assumed that this insulation is installed and maintained in accordance with the plant specifications. The surveillance and maintenance of the Kaowool insulation is included in the monitoring program. Per Appendix Q.2.2 of NUREG/CR-6850, cable trays provided with covers and Kaowool insulation have been credited to prevent ignition of the cables within the trays. Some cable trays are provided with top covers, bottom covers, or are fully enclosed, which allows for credit for Fire PRA risk reduction. Cable tray covers do not impact the cable damage thresholds, but are credited with delaying damage and ignition to thermoplastic and thermoset cables in accordance with NUREG/CR-0381 and NUREG/CR-6850, Appendix Q.2.2, respectively. Cable trays that contain Kerite FR cables conservatively used the same damage and ignition delay for trays that contain thermoplastic cables. Fire growth and propagation was not postulated for fully enclosed cable trays. The acceptability of these covers was based on visual inspection. These cable tray covers have been evaluated and confirmed to be outside the ZOI of any high hazard event (e.g., HEAF, hydrogen or transformer explosion) which may cause mechanical damage to the cover, or, if within the ZOI of a high hazard event, cable tray covers are not credited to prevent damage and/or ignition in those scenarios. Tray covers were visually inspected for holes or gaps. Any top or bottom covers or enclosures with holes or gaps were not credited to delay damage; however, credit may be given to delay ignition, as long as the holes or gaps are very small (i.e., 1 inch or less) and infrequent (i.e., spaced 3 or more feet apart). Postulating full ignition of the trays with these covers would be overly conservative due to the small size of the gaps. In addition, the small number of gaps ensures that there is a very low probability of a fire being precisely located such that it is capable of igniting the cables within the tray covers. Some Fire PRA cable trays, conduit, and cables are provided with fire wrap or ERFBS, with a fire-resistance rating specified by the manufacturer. Existing fire wraps were visually inspected and have been evaluated and confirmed to be outside the ZOI of any high hazard event (e.g., HEAF, hydrogen or transformer explosion) which may cause mechanical damage to the wraps; or, if within the ZOI of a high hazard event, wraps are not credited to prevent damage in those scenarios. All fire wraps confirmed to be currently intact, undamaged, and outside the ZOI of high hazard events, were credited in the DBNPS Fire PRA analysis to prevent fire damage to the wrapped Fire PRA targets for the duration of the manufacturer's rating. Embedded conduit is provided with at least 2-7/8" of concrete cover based on Davis-Besse calculation C-FP-013.06-122. This calculation shows that the concrete cover will prevent damaging temperatures from being reached in the embedded conduit for one hour when exposed to environmental temperatures following an ASTM E-119 curve. Concrete cover of embedded conduit has therefore been credited with preventing fire damage for 60 minutes of fire exposure.	• NUREG/CR-6850, Volume 2, Appendix Q, 2005 • Drawing E-898, Rev. 3 • NUREG/CR-0381, Table V, 1978 • C-FP-013.06-122, Rev. 0

Table J-3 - Technical Basis for Damage Thresholds used in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
Sensitive Electronics Treatment	NUREG/CR-6850, Section H.2 recommends the use of 65°C and 3 kW/m^2 as the critical damage temperature and heat flux for solid state components (e.g., temperature-sensitive electronic equipment). Analyses that consider damage to sensitive electronics by hot gas layer immersion (i.e., gas layers above 65°C engulfing the cabinet) are consistent with the critical temperature threshold established in the NUREG/CR-6850 guidance. The sensitive electronic hot gas layer analysis is documented in the Appendix B of R1957-0511-0001. Damage to temperature sensitive plant equipment caused by radiant heat follows the guidance of a study using FDS that is included in Report R1957-0511-0001 and referenced in FPRA FAQ 13-0004. The FDS study concludes that the metal housing of temperature sensitive equipment is effective in reducing damaging heat fluxes so that the damage threshold for thermoset cable can be used. This treatment is consistent with the guidance in FPRA FAQ 13-0004. FPRA FAQ 13-0004 includes caveats that can invalidate the use of the thermoset heat flux damage threshold. These caveats include the presence of louvers or vents on the face of a panel, and sensitive electronics that are mounted to the surface of the cabinet. Walkdowns were performed to determine if the cabinet should make use of the heat flux damage threshold of FPRA FAQ 13-0004. If a cabinet violated one of these caveats, the damage criteria used for the cabinet was based on the temperature sensitive component damage criteria (i.e., 3 kW/m^2 and 65°C) as provided in NUREG/CR-6850, Section H.2. However, these caveats were not considered violated if the vents are positioned such that there is no gap in shielding that would allow radiant heat to damage the sensitive components (e.g., pointed down louvers).	• NUREG/CR-6850, Volume 2, Appendix H, 2005 • R1957-0511-0001, Revision 3, Appendix B • FPRA FAQ 13-0004

Table J-4 - Fire Modeling Application

Method/Approach	Description of Method	Basis Document(s)
Algebraic Models	The limitations and assumptions associated with the Fire Dynamics Tools (FDTs) algebraic models are documented in NUREG-1805, NUREG-1824, NUREG-1934, and the DBNPS fire modeling verification and validation documentation. Using this guidance, the fire modeling analyst manually calculates and verifies that the fire modeling tools are used within the limits and ranges of applicability. To demonstrate that the FDTs were used within the applicable guidelines for nuclear power plants, the FDT input parameters were analyzed to determine they are within the normalized parameter ranges summarized in NUREG-1934. In most cases, the subject correlations have been applied within the validated range reported in NUREG-1934. In cases where the models have been applied outside the validated range reported in NUREG-1934, these have been justified as acceptable, either by qualitative analysis of the conservative assumptions in the model and the resulting safety margin (e.g., the heat release rate selected provides a bounding zone of influence), or by quantitative sensitivity analysis. Technical details demonstrating the models are within range, as well as any justification of models outside the range or parameters that do not apply to a given scenario, are documented in report R1957-0511-0001.	• NUREG-1805 • NUREG-1824 • NUREG-1934 • R1957-0511-0001, Rev. 3
CFAST Models	CFAST was verified and validated by NUREG-1824, which provides the limitations of model applicability. This analysis utilized CFAST within the limitations discussed in NUREG-1824 by conservatively following the guidance provided in model preparation. To demonstrate that the CFAST analyses were performed within the applicable guidelines for nuclear power plants, the model input parameters were analyzed to determine that they were within the normalized parameters ranges summarized in NUREG-1934. In most cases, the subject correlations have been applied within the normalized parameter range reported in NUREG-1934. In cases where the models have been applied outside the validated range, their use has been justified as acceptable, either by qualitative analysis of the conservative assumptions in the model and the resulting safety margin (e.g., the heat release rate selected provides a bounding zone of influence), or by quantitative sensitivity analysis. Technical details demonstrating the models are within range, as well as any justification of models outside the range or parameters that do not apply to a given scenario, are documented in report R1957-0511-0001.	• NUREG-1824 • NUREG-1934 • R1957-0511-0001, Rev. 3

Table J-4 - Fire Modeling Application

Method/Approach	Description of Method	Basis Document(s)
FDS Models	FDS was verified and validated by NUREG-1824, which provides the limitations of model applicability. These analyses utilized FDS within the limitations discussed in NUREG-1824 by conservatively following the guidance provided in model preparation. To demonstrate that the FDS analyses were performed within the applicable guidelines for nuclear power plants, the model input parameters were analyzed to determine they are within the normalized parameter ranges summarized in NUREG-1934. In most cases, the subject correlations have been applied within the normalized parameter range reported in NUREG-1934. In cases where the models have been applied outside the validated range, their use has been justified as acceptable, either by qualitative analysis of the conservative assumptions in the model and the resulting safety margin (e.g., the heat release rate selected provides a bounding zone of influence), or by quantitative sensitivity analysis. Technical details demonstrating the models are within range, as well as any justification of models outside the range or parameters that do not apply to a given scenario, are documented in report R1957-0511-0001.	• NUREG-1824 • NUREG-1934 • R1957-0511-0001, Rev. 3

Table J-5 - Qualifications of Users in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
Qualification Requirements for Personnel Performing Fire Modeling Calculations	Fire modeling calculations have been, and will be, performed by engineers who meet the qualification requirements of Section 2.7.3.4 of NFPA 805 (2001). Fire modeling to support the License Amendment Request (LAR) and Fire Probabilistic Risk Assessment (PRA) development was performed by FENOC and contract personnel using their respective companies' procedures and Quality Assurance programs. These procedures require that project personnel assigned to each task have the proper experience and training to perform the work. This is verified by FENOC and contractor company management. All contractor engineering procedures and quality assurance manuals have been reviewed for compliance with the FENOC Quality Assurance Program. These FENOC and contractor personnel were chosen based on their experience and expertise in fire modeling. The qualifications needed to perform fire modeling related tasks depend, in part, on the specific role of the personnel. Appropriate qualifications for FENOC and contractor personnel using, applying, and approving fire modeling tools include required reading on fire modeling Project Instructions, relevant industry methodology and/or guidance documents such as NUREG/CR-6850, NUREG-1934, NUREG-1805, and applicable fire modeling software user's guide documents. Other requirements include training and/or mentoring in Fire Growth Analysis, ZOI calculations, and Fire Modeling Tools. The qualification requirements to perform other fire modeling related tasks depend in part on the personnel's specific assigned role. Some sub-tasks of fire modeling, may be assigned to other staff with experience and skill set commensurate with the task. Example tasks include walkdown data collection, raceway drawing reviews, and data entry. During the NFPA 805 post-LAR submittal and implementation phase of the transition (i.e., LAR submittal to receipt of the NRC Safety Evaluation (SE)), FENOC will continue to utilize qualified FENOC and contractor personnel. In addition, as stated in LAR Section 4.7.3, FENOC will develop qualification requirements for FENOC personnel to perform fire modeling. These qualification guides will be developed per applicable FENOC training program procedures and in accordance with the FENOC Quality Assurance Program. Implementation item DB-2037 has been created to develop position specific guides meeting the requirements of NFPA 805 Section 2.7.3.4, regarding personnel qualifications.	• NOBP-CC-1006, Rev. 4 • NOP-CC-1003, Rev. 2 • NOP-TR-1200, Rev. 1

Table J-5 - Qualifications of Users in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
Process for Ensuring Fire Modeling Personnel have Appropriate Qualifications	Fire modeling to support the LAR and Fire PRA development (i.e., before the transition) was performed by FENOC and contractor personnel using their respective companies' procedures and Quality Assurance programs. These procedures require that FENOC and any contractor management be responsible for the overall project performance of fire modeling tasks and for ensuring that project personnel assigned to each task have the proper experience and training to perform the work. Engineers performing fire modeling are required to perform their duties in accordance with the fire modeling procedure and Quality Assurance program. This process was followed to ensure the personnel performing fire modeling were qualified. All contractor engineering procedures and quality assurance manuals have been reviewed for compliance with the FENOC Quality Assurance Program. During the transition (i.e., LAR submittal to receipt of the NRC Safety Evaluation), FENOC will continue to utilize qualified personnel to perform fire modeling and will continue to use the process described above. Additionally, qualification requirements and training will be created to provide a means of qualifying FENOC engineers to perform fire modeling. To address this implementation item, Qualification Guides will be developed and implemented per applicable FENOC training program procedures and in accordance with the FENOC Quality Assurance Program. When FENOC personnel perform fire modeling post transition, the FENOC processes for developing qualifications will be followed to ensure that assigned personnel are qualified. FENOC training procedures require that personnel be qualified to perform assigned tasks and managers and supervisors are responsible for ensuring that personnel are qualified. Once the fire modeling Qualification Guides are developed, the new guidance, in conjunction with existing FENOC training procedures will ensure personnel performing fire modeling are qualified and that their qualifications are adequately maintained. Implementation item DB-2037 has been created to develop position specific guides meeting the requirements of NFPA 805 Section 2.7.3.4, regarding personnel qualifications.	• NOBP-CC-1006, Rev. 4 • NOP-CC-1003, Rev. 2 • NOP-TR-1200, Rev. 1
Proper Communication between Fire Modeling and FPRA Personnel	Throughout the DBNPS FPRA process, the fire modeling personnel and the FPRA personnel maintained frequent communications. Periodic meetings with the entire FPRA and fire modeling teams were performed, as necessary to ensure proper communication. Any contractor-prepared fire modeling analyses were developed into approved vendor documents which were then used as input to the Fire PRA. These analyses are controlled under the calculation review process, per NOP-CC-3002, which requires that appropriate cross-disciplinary reviews are performed and impacted departments are notified of the change (i.e., the PRA Group).	• NOP-CC-2004, Rev. 10 • NOP-CC-3002, Rev. 7

Table J-5 - Qualifications of Users in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
Consistency between Multiple Supporting Consultants Involved in Fire Modeling	For consistency, each major fire modeling task (i.e., scoping fire modeling, detailed fire modeling, multi-compartment analysis, and main control room analysis) was performed using a single procedure and a consistent methodology were utilized for each task. All applicable contractor engineering procedures and quality assurance manuals have been reviewed for compliance with the FENOC Quality Assurance Program to ensure consistency. In addition, as stated in LAR Section 4.7.3, FENOC will develop qualification requirements for FENOC personnel to perform fire modeling. To ensure future consistency between FENOC personnel and supporting consultants, all post-transition fire modeling will be performed in accordance with these FENOC-developed qualification requirements. If a supporting consultant is used in the future, the vendor procedure(s) will be reviewed for consistency with the FENOC-developed qualification requirements. Implementation item DB-2037 has been created to develop position specific guides meeting the requirements of NFPA 805 Section 2.7.3.4, regarding personnel qualifications.	• NOP-CC-1003, Rev. 2 • NOP-CC-3002, Rev. 7

Table J-6 - Uncertainty in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
Fire Model Input Parameter Uncertainty	Fire modeling was performed in support of the DBNPS Fire PRA, utilizing codes and standards developed by industry and NRC and that were verified and validated in authoritative publications such as NUREG-1824. In general, the fire modeling was performed using conservative methods and input parameters that were based upon NUREG/CR-6850. This approach was used based upon the current state of knowledge regarding the uncertainties related to the application of the fire modeling tools and associated input parameters for specific plant configurations. The detailed fire modeling task develops a probabilistic output in the form of target failure probabilities and are subject to both aleatory (statistical) and epistemic (systematic) uncertainty. Aleatory uncertainties identified within the fire modeling parameters include: • Detector response reliability and availability • Automatic suppression system reliability and availability • Manual suppression reliability with respect to time available Epistemic uncertainties which impact the zone of influence and time to damage range include: • Heat release rates (peak HRR, time to reach peak, steady burning time, decay time) • Number of cabinet cable bundles • Ignition source fire diameter • Room ventilation conditions • Fire growth assumptions (cable tray empirical rule set, barrier delay) • Cable fire spread characteristics for horizontal and vertical trays • Transient fires (peak HRR, time to reach peak, location factor, detection time) • Oil fires (spill assumptions) • Assumed target location • Target damage threshold criteria • Manual detection time • Mean prompt suppression rate • Manual suppression rate • Welding and cutting target damage set	• NUREG/CR-6850, Volume 2, 2005 • NUREG-1824, Volume 3, 4, 5, and 7, 2007 • NEI 04-02, Section D.2, 2008 • FAQ 08-0043, 2009 • NUREG/CR-7010, Section 9.2.2. 2012

Table J-6 - Uncertainty in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
	• Transient target impacts • Superposition of damaging sources (e.g., plume, radiant heat, etc) Appendix V of NUREG/CR-6850 recommends that to the extent possible, modeling parameters should be expressed as probability distributions and propagated through the analysis to arrive at target failure probability distributions. These distributions should be based on the variation of experimental results as well as the analyst's judgment. To the extent possible, more than one fire model can be applied and probabilities assigned to the outcome which describes the degree of belief that each model is the correct one. Due to the uncertainty with each of these parameters, the fire modeling task has selected conservative values for some of key input parameters while utilizing the mean values for the rest to provide safety margin as described below. Per NEI 04-02, there is no clear definition of an adequate safety margin; however, the safety margin should be sufficient to bound the uncertainty within a particular calculation or application. The DBNPS fire modeling documentation for each fire compartment provides a list of items that were modeled conservatively and that provide safety margin. Some examples include the following items: • The majority of the DBNPS Fire PRA's scenarios involving electrical equipment (including the electrical split fraction of pump fires) utilize the 98th percentile HRR for the zone of influence. This is considered conservative. • The HRR value for some cabinets was based upon non-qualified internal cable. This results in a conservative HRR as these cabinets likely contain some amount of qualified cable. • The fire elevation in most cases is at the top of the cabinet or pump body. This is considered conservative, since the combustion process will occur where the fuel mixes with oxygen, which is not always at the top of the ignition source. Additionally, the guidance of FAQ 08-0043 recommends fire be modeled 1 foot below the top of the electrical cabinets that are sealed at the top, and reinforces that this method is conservative. • The radiant fraction utilized is 0.4. This represents a 33% safety margin over the normally recommended value of 0.3. In addition, the convective heat release rate fraction utilized is 0.7. The normally recommended value is between 0.6 and 0.65, and thus the use of 0.7 is conservative. • For transient fire impacts, a large bounding transient zone assumes all targets within its ZOI are affected by a fire. Time to damage is usually calculated based on the most severe (closest) target. This is considered conservative, since a transient fire would actually have a much smaller ZOI and varying damage times for the various HRR bins which make up the total HRR probability distribution. This approach is implemented to minimize the multitude of transient scenarios to be analyzed.	

Table J-6 - Uncertainty in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
	• In some fire compartments, transient fires assume damage to all targets from the floor to the ceiling. This is conservative since most transient fires are not expected to have a ZOI that would reach the ceiling. • The fire elevation for transient fires was assumed to be 2 feet to account for any transient fires not occurring at floor level. This is conservative since most transient fires are expected to be below this height (e.g., at floor level). • For HGL calculations using the MQH correlation, no equipment or structural steel is credited as a heat sink, because the closed-form correlations used do not account for heat loss to these items. • For the non-FDS analyses, as the fire propagates to secondary combustibles, the fire is conservatively modeled as one single fire using the fire modeling closed-form correlations. The resulting plume temperature estimates used are therefore conservative, since the fire would actually be distributed over a large surface area, and would be less severe at the target location. • For most scenarios, target damage is assumed to occur when the exposure environment meets or exceeds the damage threshold. No additional time delay due to thermal response is given. • Oil fires are analyzed as both unconfined and confined spills. Unconfined spills result in large heat release rates, but usually burn for seconds. Most oil fires have been conservatively analyzed for 20-minutes to account for the uncertainty in the oil spill size. • For many scenarios, automatic or manual detection and suppression are not credited which leads to conservative results. • Scenarios that identify the time to automatic detection and suppression do not utilize the approach of adding the HGL temperature to the ceiling jet temperature. Including the effects of a HGL would result in shorter detection and suppression times; therefore, the use of the ceiling jet correlation is considered conservative. • All fires modeled using FDS or CFAST assume that the fire does not experience the effects of oxygen deprivation. This is a conservative assumption that enables the fire to continuously burn in environments with oxygen levels below that required to sustain the prescribed HRR. • The FDTs generally over-predict hot gas layer temperatures and this over-prediction is expected to lead to conservative results. • Not every cable tray is filled to capacity. In many cases, cable trays that are partially full have been assumed to be filled to capacity, which provided a conservative estimate of the surface area and corresponding fire severity. • For some scenarios fire propagation to the first cable tray has been estimated to be one minute.	

Table J-6 - Uncertainty in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
	In most cases, propagation to the first cable tray would be greater than one minute; therefore, this is considered conservative. • Cable trays with any amount of thermoplastic cable, regardless of percentage were treated as thermoplastic for fire spread rate, even though NUREG/CR-7010 would allow predominant type to be used. • High energy arcing fault scenarios were conservatively assumed to be at peak fire intensity for 20-minutes from time zero (ignition), even though the initial arcing fault is expected to consume the contents of the cabinet and burn for only a few minutes. • For many non-risk significant scenarios, conduit elevations were assumed to be within the flame height such that they were subjected to damaging plume temperatures and a potential damaging radiant heat flux.	

Table J-6 - Uncertainty in Fire Modeling

Method/Approach	Description of Method	Basis Document(s)
Model and Completeness Uncertainty	In the area of the fire modeling, "model" uncertainties and associated assumptions can be introduced through two separate phases of the fire modeling; first from selection of fire modeling tools such as FDTs and CFAST, and secondly through their applications to the development of fire scenarios. NUREG-1934 states that “model” uncertainties can be estimated using the processes of verification and validation. Model uncertainty is based primarily on comparisons of model predictions with experimental measurements as documented in NUREG-1824 and other model validation studies. All of the fire models used and listed in Table J-1 were within or very near the experimental uncertainty, as determined by NUREG-1824. Where applicable, all fire models listed in Table J-7 were applied within the validation ranges or the use was justified as acceptable with a subsequent analysis. Each model is discussed Table J-7. Regarding “completeness" uncertainties, these refer to the fact that a model may not be a complete description of the phenomena it is designed to predict. Completeness uncertainty was addressed by the same process used to address the model uncertainty. Model and completeness uncertainty are closely related, and it would be impractical to evaluate them separately. Therefore, the discussion above for “model” uncertainties, as well as the conservative approaches discussed in the “Fire Model Input Parameter Uncertainty” heading above address “completeness” uncertainty. For uncertainties specifically involved with ignoring the contents of a compartment, there were several areas of conservatism that mitigate the reduction in volume in HGL calculations. The following assumptions were utilized within the fire modeling which lead to conservatism or reduced the impact of ignoring the contents of a compartment in the fire modeling analysis: • If equipment was included in HGL calculations, a large heat sink was provided in the fire compartment, which would have generated lower HGL temperatures. • No heat passage through fire doors or dampers was considered in the HGL temperature calculations. The material properties of concrete were applied to all exterior boundaries of the fire compartment. Realistically, the heat from the HGL would be transferred to adjacent spaces more easily by a door or fire damper, which have a higher thermal conductivity than concrete. Including these passages to adjacent compartments would have generated lower HGL temperatures. • Although obstructions within the room could reduce the effective volume when analyzing HGL temperatures, many of these obstructions (e.g., electrical cabinets, transformers) are not totally solid obstructions. Electrical cabinets are generally not full of electrical components on the inside (i.e., they have large empty spaces within the cabinets). These empty spaces within the electrical cabinets reduce the impact of including obstructions for HGL temperature calculations.	• NUREG-1934, Section 2.3.5 and 4, 2012 • NUREG-1824, Volume 1, 3, 4, 5, and 7, 2007 • R1957-0511-0001, Rev. 3

Table J-7 - Fire Modeling Limitations

Method/Approach	Description of Method	Basis Document(s)
Hot Gas Layer Temperature using FDTs	The predictive capability of this parameter using FDTs is characterized as YELLOW+ according to NUREG-1824, Volume 1, Table 3-1. As stated in NUREG-1824, Volume 1, Section 2.6.2, a YELLOW± characterization is assigned "If the first criterion is satisfied and the calculated relative differences are outside the experimental uncertainty but indicate a consistent pattern of model over-prediction or under-prediction, then the model predictive capability is characterized as YELLOW+ for over-prediction, and YELLOW- for under-prediction. The model prediction for the specific attribute may be useful within the ranges of experiments in this study, and as described in Tables 2-4 and 2-5, but the users should use caution when interpreting the results of the model. A complete understanding of model assumptions and scenario applicability to these V&V results is necessary. The model may be used if the grade is YELLOW+ when the user ensures that model over-prediction reflects conservatism. The user must exercise caution when using models with capabilities described as YELLOW±. " NUREG 1824, Volume 3, Section 6.1 states that: "The FDTs models for HGL temperature capture the appropriate physics and are based on appropriate empirical data. FDTs generally over-predict HGL temperature, outside of uncertainty." The over prediction is expected to lead to conservative results and increased safety margin.	• NUREG-1824, Volume 1 and 3, 2007 • R1957-0511-0001, Rev. 3
Hot Gas Layer Height and Temperature using FDS	The predictive capability of these parameters in FDS is characterized as GREEN according to Table 3-1 of NUREG-1824. A GREEN characterization is given “If both criteria are satisfied (i.e., the model physics are appropriate for the calculation being made and the calculated relative differences are within or very near experimental uncertainty), then the V&V team concluded that the fire model prediction is accurate for the ranges of experiments in this study, and as described in Tables 2-4 and 2-5. A grade of GREEN indicates the model can be used with confidence to calculate the specific attribute. The user should recognize, however, that the accuracy of the model prediction is still somewhat uncertain and for some attributes, such as smoke concentration and room pressure, these uncertainties may be rather large. It is important to note that a grade of GREEN indicates validation only in the parameter space defined by the test series used in this study; that is, when the model is used within the ranges of the parameters defined by the experiments, it is validated.” The NUREG-1824, Volume 7, Section 6.1 states that: “FDS is suitable for predicting HGL temperature and height, with no specific caveats, in both the room of origin and adjacent rooms. In terms of the ranking system adopted in this report, FDS merits a Green for this category, based on… The FDS predictions of the HGL temperature and height are, with a few exceptions, within experimental uncertainty.”	• NUREG-1824, Volume 1 and 7, 2007 • R1957-0511-0001, Rev. 3

Table J-7 - Fire Modeling Limitations

Method/Approach	Description of Method	Basis Document(s)
Hot Gas Layer Temperature and Height using CFAST	The predictive capability of these parameters in CFAST was characterized as GREEN according to NUREG-1824, Volume 1, Table 3-1. The GREEN designation is discussed above under the "Hot Gas Layer Height and Temperature using FDS" heading. Specifically, the GREEN designation was assigned to the CFAST HGL temperature parameter calculated in the fire compartment of origin. Compartments remote from the fire were assigned a YELLOW designation which "suggests that one exercise caution when using the model to evaluate this quantity – consider carefully the assumptions made by the model, how the model has been applied, and the accuracy of the results." As stated in NUREG-1824, Volume 1, Section 2.6.2, a YELLOW characterization is assigned "If the first criterion is satisfied and the calculated relative differences are outside experimental uncertainty with no consistent pattern of over- or under-prediction, then the model predictive capability is characterized as YELLOW. A YELLOW classification is also used despite a consistent pattern of under or over-prediction if the experimental data set is limited. Caution should be exercised when using a fire model for predicting these attributes. In this case, the user is referred to the details related to the experimental conditions and validation results documented in Volumes 2 through 6. The user is advised to review and understand the model assumptions and inputs, as well as the conditions and results to determine and justify the appropriateness of the model prediction to the fire scenario for which it is being used. " NUREG-1824, Volume 5, Section 6.1 summary states: "The CFAST predictions of the HGL temperature and height are, with a few exceptions, within or close to experimental uncertainty. The CFAST predictions are typical of those found in other studies where the HGL temperature is typically somewhat over-predicted and HGL height somewhat lower than experimental measurements. These differences are likely attributable to simplifications in the model dealing with mixing between the layers, entrainment in the fire plume, and flow through vents. Still, predictions are mostly within 10% to 20% of experimental measurements."	• NUREG-1824, Volume 1 and 5, 2007 • R1957-0511-0001, Rev. 3

Table J-7 - Fire Modeling Limitations

Method/Approach	Description of Method	Basis Document(s)
Ceiling Jet Temperature using the Alpert Correlation	The predictive capability of this parameter using the Alpert correlation in the Fire Induced Vulnerability Evaluation (FIVE) fire model is characterized as YELLOW+ according to NUREG-1824, Volume 1, Table 3-1. The YELLOW+ designation is discussed above under the "Hot Gas Layer Temperature using FDTs" heading. Specifically, NUREG-1824, Volume 4, Section 6.2 summary states: “The Alpert correlation under-predicts ceiling jet temperatures in compartment fires with an established hot gas layer. This result is expected because the correlation was developed without considering HGL effects. The original version of FIVE accounted for HGL effects by adding the ceiling jet and HGL temperature. This practice results in consistent over-predictions of the ceiling jet temperature. The approach of adding ceiling jet temperatures to the calculated hot gas layer continues to be the recommended method for FIVE-Rev 1 users. Based on the above discussion, a classification of Yellow+ is recommended if HGL effects on the ceiling jet temperature are considered using the approach described in the above bullet. The Alpert correlation by itself is not intended to be used in rooms with an established hot gas layer.” The approach of adding the hot gas layer temperature to the ceiling jet temperature was not used in the DBNPS fire modeling analysis. The primary application of the ceiling jet correlation at DBNPS was the determination of detection and suppression timing, in which the ceiling jet velocity is a sub-model in the analysis. Including the effects of a hot gas layer would have resulted in shorter detection and suppression times, and therefore the DBNPS approach is conservative. The use of the ceiling jet correlation for target damage was bounded by the use of the point source radiation model and is justified and discussed in report R1957-0511-0001.	• NUREG-1824, Volume 1 and 4, 2007 • R1957-0511-0001, Rev. 3
Plume Temperature using FDTs	The predictive capability of this parameter using FDTs is characterized as YELLOW- according to NUREG-1824, Volume 1, Table 3-1. The YELLOW- designation is discussed above under the "Hot Gas Layer Temperature using FDTs" heading. NUREG-1824, Volume 3, Section 6.2 summary states "The FDTs model for plume temperature is based on appropriate empirical data and is physically appropriate. FDTs generally under-predicts plume temperature, outside of uncertainty, because of the effects of the hot gas layer on test measurements of plume temperature. The FDTs model is not appropriate for predicting the plume temperatures at elevations within a hot gas layer." The FDTs plume correlation for fire modeling applications was used within the limitations provided in NUREG-1824. The effects of the plume and hot gas layer interaction were analyzed and documented in report R1957-0511-0001. The use of the FDTs plume correlation was used in accordance with the results of this analysis.	• NUREG-1824, Volume 1 and 4, 2007 • R1957-0511-0001, Rev. 3

Table J-7 - Fire Modeling Limitations

Method/Approach	Description of Method	Basis Document(s)
Plume Temperature using FDS	The predictive capability of this parameter using FDS is characterized as YELLOW according to NUREG-1824, Table 3-1. The YELLOW designation is discussed above under the “Hot Gas Layer Temperature and Height using CFAST” heading. NUREG-1824, Volume 7, Section 6.3 summary states: "The FDS hydrodynamic solver is well-suited for this application. FDS over-predicts the lower plume temperature in BE #2 because it over-predicts the flame height. FDS predicts the FM/SNL plume temperature to within experimental uncertainty. The simulations of BE #2 and the FM/SNL series are the most time-consuming of all six test series, mainly because of the need for a fairly fine numerical grid near the plume. It is important that a user understand that considerable computation time may be necessary to well-resolve temperatures within the fire plume. Even with a relatively fine grid, it is still challenging to accurately predict plume temperatures, especially in the fire itself or just above the flame tip. There are only nine plume temperature measurements in the data set. A more definitive conclusion about the accuracy of FDS in predicting plume temperature would require more experimental data." In accordance with the guidance provided in NUREG-1934, a D*/ dx ratio of 5 to 10 produces favorable FDS results at moderate computational cost. This guidance was applied in the DBNPS FDS applications that analyzed plume temperatures. The meshes used in DBNPS fire modeling were considered to be sufficiently fine to analyze plume temperatures in each case. In addition, the plume temperatures within the flaming region are not the focal point of either study.	• NUREG-1824, Volume 1 and 7, 2007 • R1957-0511-0001, Rev. 3
Flame Height using FDTs	The predictive capability of this parameter using FDTs is characterized as GREEN according to NUREG-1824, Table 3-1. The GREEN designation is discussed above under the "Hot Gas Layer Height and Temperature using FDS" heading. NUREG-1824, Volume 3, Section 6.3 summary states "The FDTs model predicted flame heights consistent with visual test observations."	• NUREG-1824, Volume 1 and 7, 2007 • R1957-0511-0001, Rev. 3

Table J-7 - Fire Modeling Limitations

Method/Approach	Description of Method	Basis Document(s)
Smoke Concentration using CFAST	The predictive capability of this parameter in CFAST is characterized as YELLOW according to NUREG-1824, Volume 1, Table 3-1. The YELLOW designation is discussed above under the “Hot Gas Layer Temperature and Height using CFAST” heading. NUREG-1824, Volume 5, Section 6.6 summary states: "CFAST is capable of transporting smoke throughout a compartment, assuming that the production rate is known and that its transport properties are comparable to gaseous exhaust products. CFAST typically over-predicts the smoke concentration in all of the BE #3 tests, with the exception of Test 17. Predicted concentrations for open-door tests are within experimental uncertainties, but those for closed-door tests are far higher. No firm conclusions can be drawn from this single data set. The measurements in the closed-door experiments are inconsistent with basic conservation of mass arguments, or there is a fundamental change in the combustion process as the fire becomes oxygen-starved.” The smoke concentration was analyzed and was used as one criterion to determine the probability of Main Control Room abandonment at DBNPS following a fire scenario in the Main Control Room. Because the smoke concentration was over-predicted for both the open-door and closed-door test configurations as indicated in NUREG-1824, the DBNPS CFAST results were considered conservative. The smoke production rates used in the model were conservatively selected from Table 3-4.16 of the SFPE Handbook of Fire Protection Engineering, 4th Edition. Because transport properties of the smoke are expected to be comparable to gaseous exhaust products, the use of the model is within the limitations and the experimental uncertainty.	• NUREG-1824, Volume 1 and 5, 2007 • R1957-0511-0001, Rev. 3 • SFPE Handbook, Table 3-4.16, 2008

Table J-7 - Fire Modeling Limitations

Method/Approach	Description of Method	Basis Document(s)
Radiant Heat using FDTs	The predictive capability of this parameter of the FDTs is characterized as YELLOW according to NUREG-1824, Volume 1, Table 3-1. The YELLOW designation is discussed above under the “Hot Gas Layer Temperature and Height using CFAST” heading. NUREG-1824, Volume 3, Section 6.4 summary states: "The FDTs point source radiation and solid flame radiation model in general are based on appropriate empirical data and is physically appropriate with consideration of the simplifying assumptions. The FDTs point source radiation and solid flame radiation model are not valid for elevations within a hot gas layer. FDTs predictions had no clear trend. The model under- and over-predicted, outside uncertainty. The point source radiation model is intended for predicting radiation from flames in an unobstructed and smoke-clear path between flames and targets." Only the FDTs point source radiation model was used in the DBNPS fire modeling. NUREG-1824 states that there is no clear trend in under- or over-prediction for the point source model. The model over-predicted heat flux for locations immersed in a hot gas layer, which is likely due to smoke and the HGL preventing radiation from reaching the gauges. This over-prediction is expected to lead to conservative results and increased safety margin. In a smaller number of cases, the model under-predicted heat flux due to contribution of radiation from the HGL. In order to account for this potential under prediction, conservatism was built into the use of the radiation model at DBNPS, including the use of a radiant heat release rate fraction of 0.4, as opposed to the normally recommended value of 0.3. In addition, NUREG-1824 states that the point source model is not intended to be used for locations relatively close to the fire. In the DBNPS For fire modeling analysis, targets located close to the fire were conservatively failed within the early stages of fire growth.	• NUREG-1824, Volume 1 and 3, 2007 • R1957-0511-0001, Rev. 3

Table J-7 - Fire Modeling Limitations

Method/Approach	Description of Method	Basis Document(s)
Radiant Heat using FDS	The predictive capability of this parameter in FDS is characterized as YELLOW according to NUREG-1824, Table 3-1. The YELLOW designation is discussed above under the "Hot Gas Layer Temperature and Height using CFAST" heading. Even though the FDS Radiant Heat Model was designated as Yellow, NUREG 1824, Volume 7, Section 6.8 states that: "FDS has the appropriate radiation and solid phase models for predicting the radiative and convective heat flux to targets, assuming the targets are relatively simple in shape. FDS is capable of predicting the surface temperature of a target, assuming that its shape is relatively simple and its composition fairly uniform. FDS predictions of heat flux and surface temperature are generally within experimental uncertainty, but there are numerous exceptions attributable to a variety of reasons. The accuracy of the predictions generally decreases as the targets move closer to, or go inside of the fire. There is not enough near-field data to challenge the model in this regard." FDS was used to calculate radiant heat exposure to determine the radiant heat exposure to an electrical cabinet from a transient fire. The limitations outlined in NUREG-1824 were not of concern based upon the following: 1) Heat flux was not calculated for any targets inside of the fire. For the FDS analyses performed, all potential radiant heat targets were located a minimum of 3 feet horizontally away from the fire. 2) All targets were simple in shape and not complex in nature. The targets analyzed were a flat sheet metal panel and heat flux monitoring devices located independent of obstructions. In both instances, the targets were of simple geometry and uniform composition. Since the model was not used outside of the limitations identified, DBNPS concluded that the FDS predictions of heat flux were within experimental uncertainty.	• NUREG-1824, Volume 1 and 7, 2007 • R1957-0511-0001, Rev. 3

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J16. Davis-Besse Procedure NOP-CC-3002, “Calculations,” Revision 7.

J17. Davis-Besse Procedure NOP-OP-1012, “Material Readiness and Housekeeping Inspection,” Revision 7.

J18. Davis-Besse Procedure NOP-TR-1200, “Conduct of Training,” Revision 1.

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K. Existing Licensing Action Transition

53 Pages Attached

Licensing Action 1: Fire Compartments FF-01, FF-02, and FF-03

An exemption has been approved from Section III.G.3 to the extent it requires full, fixed fire suppression in an area for which alternate shutdown capability is provided. The alternate shutdown capability is physically and electrically independent of Fire Compartments FF-01, FF-02, and FF-03.

Basis Date: 11/23/1982

To Be Transitioned? No

Basis:

III.G.3 requires that alternate or dedicated shutdown capability be protected by smoke detection and a fixed fire suppression system. In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration. The Control Room (Appendix R Fire Area FF) does not comply with Section III.G.3 because it is not provided with an automatic suppression system. DBNPS submitted an exemption request on April 29, 1982, (Serial No. 815) requesting an exemption from Section III.G for the lack of fixed fire suppression system in the Control Room.

The NRC issued an SER dated November 23, 1982, (Log No. 1138) that stated, in part, "…the installation of a fixed fire suppression system will not increase significantly the level of fire protection safety in the control room, …."

The exemption was granted due to the Control Room/cabinet room containing the following features:

1. Continuous manning
2. Area fire detectors
3. Internal cabinet fire detectors for safety-related control panels
4. Hose station
5. Fire extinguishers
6. Low fire load
7. Alternate shutdown system is available, which provides remote control capabilities for those systems necessary to maintain SSD capability from outside the Control Room
8. Control Room operators are qualified firefighters

Licensing Action 1: Fire Compartments FF-01, FF-02, and FF-03

Fire Compartment	Description
FF-01, FF-02, and FF-03	Control Room/Cabinet Room

Reference Document

- Log No. 1138, SER dated November 23, 1982, “Appendix R to 10 CFR 50, Exemption From Certain Technical Requirements”
- Serial No. 815, "Topic: Appendix R Request for Exemptions in Control Room and Component Cooling Water Room, April 29, 1982"

Evaluation:

The November 23, 1982, (Log No. 1138) SER stated that the fire protection features currently installed in the Control Room/cabinet room and the continuous manning of the Control Room provide adequate DID firefighting capability for these areas. The licensee has stated that the Control Room/cabinet room is equipped with area fire detectors and internal cabinet fire detectors for safety related control panels. The Control Room/cabinet room is provided with both a hose station and fire extinguishers for manual firefighting, and the fire load in the area is low. In addition, an alternate shutdown system is available, which provides remote control capabilities for those systems necessary to maintain SSD capability from outside the Main Control Room.

Plant Technical Specifications require continuous occupancy of the Control Room by the operators. Because the operators constitute a continuous fire watch, manual fire suppression in event of a fire would be prompt and effective, and thus, a fixed suppression system is not necessary to achieve adequate fire protection in this area.

Validation/Conclusions:

This exemption is no longer necessary, as Fire Compartments FF-01, FF-02, and FF-03 (Appendix R Fire Area FF) will be evaluated using the performance-based approach as identified in NFPA 805 Section 4.2.4. As such, the existing exemption will not be transitioned into the NFPA 805 license basis.

Associations:

None

Licensing Action 2: CCW Pump Separation

An exemption has been approved from Section III.G.2 to the extent that it requires separation of redundant SSD components with a 1-hour rated fire barrier where less than 20 feet of separation exists. The CCW pumps are not separated by a 1-hour rated fire barrier.

Basis Date: 12/26/2002

To Be Transitioned? Yes

Basis:

This exemption requires NRC approval and is being submitted in LAR Att. L as Approval Item 8. Once approved, this licensing action will be compliant under 10 CFR 50.48(c).

Fire Compartment T-01 (Appendix R Fire Area T) does not comply with Section III.G.2 because 1-hour fire barriers have not been installed between the CCW water pumps, and the separation is less than 20 feet between them. DBNPS submitted an exemption request on April 29, 1982, (Serial No. 815) requesting an exemption from Section III.G for the lack of 20-foot separation between the CCW pumps.

The NRC issued an SER dated November 23, 1982, (Log No. 1138) that stated, in part, "…the installation of one-hour-rated fire barriers between the component cooling water pumps will not increase significantly the level of fire protection in the component cooling water heat exchanger and pump room."

On December 21, 2000, DBNPS submitted a letter (Serial No. 2680) that requested an amendment of an exemption approved by the NRC in Log No. 1138. The letter referenced DBNPS letter dated March 15, 1989 (Serial No. 1642) when it stated, “The letter noted that the manual operator action to establish temporary ventilation in the CCW pump room in the event of a fire is no longer considered necessary since the CCW pumps would not overheat despite the fire and postulated loss of the CCW pump room ventilation.”

The amended exemption request was approved by the NRC in a letter dated December 26, 2002 (Log No. 6041). The exemption stated, “The licensee concluded that since the sprinkler system operated at 165 °F, the sprinkler system would keep the pumps from reaching 185 °F, allowing the pumps to remain operational.”

In another letter dated December 14, 2004, (Serial No. 3105) DBNPS indicated that the temperature cited in Log No. 6041 was incorrect. DBNPS had installed a new sprinkler system in the CCW pump room, and the fusible links in the new system actuate at 212 degrees F. DBNPS performed an engineering evaluation and confirmed that the technical basis for the December 26, 2002, exemption remained valid.

Licensing Action 2: CCW Pump Separation

The exemption was granted.

A review performed for NFPA 805 found the features in the CCW pump room support approval of a revised basis for this exemption, as explained in Attachment L, Approval Item 8. Once approved, this licensing action will be compliant under 10 CFR 50.48(c).

Fire Compartment	Description
T-01	CCW Pump Room

Reference Document

- Log No. 1138, "Appendix R to 10CFR50 – Exemption From Certain Technical Requirements"
- Log No. 6041, "Exemption from the Requirements of 10 CFR 50, Section III.G of Appendix R"
- Serial No. 815, "Topic: Appendix R Request for Exemptions in Control Room and Component Cooling Water Room, April 29, 1982"
- Serial No. 1642, "Fire Protection – Manual Operator Actions"
- Serial No. 2680, "Request to Amend the Existing Exemption for Component Cooling Water Heat Exchanger and Pump Room"
- Serial No. 3105, "Updated Information Regarding the Existing Exemption from 10 CFR 50 Appendix R, for the Component Cooling Water Heat Exchanger and Pump Room"

Evaluation:

The exemption (Log No. 6041) states:

> *The SSD requirements at DBNPS require at least one CCW pump to remain operational during and after a fire. The November 23, 1982, exemption allowed less than 20 foot separation and no fire barriers between the CCW pumps. This was based on the existence of adequate active and passive fire protection features that provided reasonable assurance that one CCW pump would remain operational. The active protection features were smoke detectors, a wet pipe sprinkler system, a manual hose station, and portable fire extinguishers. The passive fire protection features provided were: low in-situ combustible loading, minimal intervening combustibles, and curbing around the pumps to contain an oil spill fire, in addition to the fire wrap that is the subject of the current exemption request.*

Licensing Action 2: CCW Pump Separation

Active fire protection features have not changed since the granting of the existing exemption and combustible loading remains low. Under the re-evaluations discussed earlier, protection of CCW header valves and ventilation circuits is not necessary in order for at least one CCW pump to remain operational during and after a fire. Modifications have changed the SW valves to fail safe and removed circuits that would cause a spurious pump trip. In summary, DBNPS has demonstrated reasonable assurance of the availability of CCW during and after a postulated fire in the CCW pump room, notwithstanding less than 20 foot separation between the CCW pumps, the absence of fire barriers and no fire wrap on the SSD cables and valves in the CCW pump room. Therefore, under these circumstances, the underlying purpose of the regulation is still achieved.

The exemption concludes:

On the basis of the staff review and evaluation of the information provided in the licensee's request to amend the existing exemption, the staff concludes that the request for exemption from the technical requirements of Section III.G.2 of Appendix R to 10 CFR Part 50 demonstrates that under the proposed alternative circumstances from original circumstances that existed at the time the existing exemption was granted, the underlying purpose of the regulation is still achieved. Thus, the NRC staff has determined that there are special circumstances present, as specified in 10 CFR 50.12(a)(2)(ii), in that application of Section III.G.2. of 10 CFR Part 50, Appendix R is not necessary in order to achieve the underlying purpose of the regulation.

The staff has further determined that the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Accordingly, the Commission hereby grants the requested exemption, which supersedes the November 23, 1982, exemption, based on the circumstances set forth herein.

Validation/Conclusions:

Conformance with the Appendix R exemption agreements reached with the NRC regarding cable separation III.G.2 criteria, as stated in NRC exemption dated December 26, 2002, was reviewed and three exemption bases statements have changed. These bases include 1) the amount of lubricating oil in Compartment T-01 is increased from six gallons to nine gallons, 2) the type of lubricating oil in the CCW pumps is updated; however, the oil flash point decreased from 450°F to approximately 400° F and 3) the combustible loading in T-01, while still low, is being increased above 1,375 BTU/ft^2 to approximately 10,000 BTU/ft^2.

Licensing Action 2: CCW Pump Separation

Validation of the exemption bases for this licensing action was performed by reviewing station-controlled procedures, drawings, and design control process documentation. Since three of the exemption bases have changed, LA-02 is included in Att. L as Approval Request 8 and requires NRC approval for transition to the NFPA 805 Licensing Basis.

With approval of LAR Attachment L Approval Item 8, this licensing action will be compliant under 10 CFR 50.48(c).

Associations:

Ch.4 - Compartment: T-01 / Subsection:

Fire Protection - Fire Compartment: A-05 / Form: Passive Protection

Fire Protection - Fire Compartment: AB-01 / Form: Passive Protection

Fire Protection - Fire Compartment: CC-01 / Form: Passive Protection

Fire Protection - Fire Compartment: G-02 / Form: Passive Protection

Fire Protection - Fire Compartment: II-01 / Form: Passive Protection

Fire Protection - Fire Compartment: T-01 / Form: Detection

Fire Protection - Fire Compartment: T-01 / Form: Passive Protection

Fire Protection - Fire Compartment: T-01 / Form: Water-Based Suppression

Fire Protection - Fire Compartment: U-01 / Form: Passive Protection

Fire Protection - Fire Compartment: UU-01 / Form: Passive Protection

Licensing Action 3: Fire Door 215 Equivalent Protection

An exemption has been approved from Section III.G.2 to the extent it requires separation of redundant SSD components by a fire barrier having a 3-hour rating. Door 215 between the two fire areas is not 3-hour rated but provides an equivalent level of protection.

Basis Date: 08/20/1984

To Be Transitioned? Yes

Basis:

Fire Compartments E-01 and F-01 (Appendix R Fire Areas E and F) do not comply with III.G.2 because Door 215 is not a 3-hour fire-rated barrier as required. DBNPS submitted an exemption request on September 30, 1983, (Serial No. 991) and provided supplemental information on December 30, 1983, (Serial 1015) because Door 215 is not a 3-hour rated fire barrier.

An NRC letter dated August 20, 1984, (Log No. 1586) was received that approved the requested exemption. It stated the following:

> *Subsection III.G.2 of Appendix R to 10 CFR 50 requires that redundant trains of equipment necessary for safe shutdown be separated by one of three specific methods to ensure that one of the redundant trains of equipment will be free of fire damage. One of the methods specified is separation by a fire barrier having a 3-hour rating including all piping, electrical, heating, ventilation, and air conditioning penetrations and personnel access doors. The licensees have requested an exemption from the requirement for a 3-hour rated barrier with respect to a door which separates rooms containing equipment necessary for safe shutdown.*
>
> *The Davis-Besse Nuclear Power Station is equipped with two auxiliary feedwater (AFW) pumps located in adjacent rooms (Room 237 in Fire Area E, Fire Zone No. E-1 and Room 238 in Fire Area F, Fire Zone F-1) separated by a 3-hour rated fire wall. Door 215 located in the fire wall separating the two rooms is designed as a pressure rated door (10 psi) to protect against the consequences of a high energy line break in either AFW pump room. The door, however, is not a UL rated fire door and has not been tested by the licensees. Instead, an engineering evaluation has been performed to determine the fire resistance of Door 215, simulating the fire test requirements of NFPA 251. The evaluation demonstrates that the door would permit a temperature rise on the unexposed face of 250°F when subjected to a 1300°F fire exposure for 25 minutes. The licensees have determined that the combustible material in either pump room would have a fire duration of less than 10 minutes. The licensees conclude that the door, if tested, would have a fire resistance significantly longer than the maximum postulated fire duration. We*

Licensing Action 3: Fire Door 215 Equivalent Protection

have reviewed the analysis and agree with the licensees. Due to the low fuel load in the area and installed smoke detection system, there is reasonable assurance that an incipient fire would be detected promptly, and the response of the fire brigade to the AFW pump room would be expected in less than 25 minutes. It is our opinion that this combination of features provides reasonable assurance that one train of AFW pumps will remain free of fire damage.

Based on our evaluation, Fire Door 215 provides a level of safety equivalent to the technical requirements of Section III.G and, therefore, the exemption requested is granted.

Fire Compartment	**Description**
E-01 and F-01	Auxiliary Feedwater Pump Rooms

Reference Document

- A-222F, Revision 16, "Fire Protection General Floor Plan EL. 565'-0""
- A-87, Revision 61, "Architectural Door Schedule"
- C-FP-013.06-023, "Fire Doors"
- C-FP-013.10-006, Revision 4, "Combustible Loading Analysis"
- CR-2012-05848, Revision 0, "Combustible Loading in AFW Pump Rooms May Exceed NRC Approved Exemption Request"
- DB-FP-00005, Revision 7, "Fire Brigade"
- E-892, Revision 9, Sheet 6, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 565"
- FHAR, Revision 24, "Fire Hazards Analysis Report"
- Log No. 1586, "Exemption From Certain Requirements of Appendix R to 10CFR50"
- Serial No. 1015, "Topic: Evaluation in Support of Door Exemption Request, December 30, 1983"
- Serial No. 991, "Topic: Appendix R Exemption Requests, September 30, 1983"
- Spec 7749-A-2, Revision 6, "Delivery and Installation of Pressure Doors"

Licensing Action 3: Fire Door 215 Equivalent Protection

Evaluation:

The NRC letter dated August 20, 1984, stated, "Based on our evaluation, Fire Door 215 provides a level of safety equivalent to the technical requirements of Section III.G and, therefore, the exemption requested is granted."

Validation/Conclusions:

Conformance with the Appendix R exemption agreements reached with the NRC regarding separation of redundant SSD components by a fire barrier having a 3-hour rating; III.G.2 criteria, as stated in NRC exemption dated August 20, 1984, has been verified. The as-built plant configuration verification process consisted of walkdowns, review of current plant procedures, plant drawings, and the design change control process documentation.

Based on NRC exemption dated August 20, 1984, (Log No. 1586) the following criteria was selected for validation in order to carry this exemption forward. Validation was performed by review of station records as identified below. The validation findings support transition of the exemption.

1. Door 215 is a pressure-rated door (10 psi).

   Drawing A-87, "Architectural Door Schedule," lists Door 215 as a pressure door of Fire Rating "A CONST" (Construction). Technical Specification for the furnishing, delivery, and installation of pressure doors, Spec 7749-A-2 includes the 10 psi peak incident pressure requirement.

2. An engineering evaluation has been performed to determine the fire resistance of Door 215, simulating the fire test requirements of NFPA 251. Verify that the evaluation demonstrates that the door would permit a temperature rise on the unexposed face of 250 degrees F when subjected to a 1300 degrees F fire exposure for 25 minutes.

   An engineering evaluation, contained within Serial No. 1015, demonstrated the door would permit a temperature rise on the unexposed face of 250 degrees F when subjected to a 1300 degrees F fire exposure for 25 minutes. The evaluation concluded 25 minutes to be “a sufficiently long time to allow for the fire brigade to take counter measures and have the situation under control.”

3. The combustible material in either pump room would have fire duration of less than 10 minutes.

   The fire severity in both rooms is not less than 10 minutes. It is over 10 minutes in both rooms. Per Appendix 12 of C-FP-013.10-006, the loading in Fire Area E is 19,380 Btu/ft^2 or 14.53 minutes; the loading in Fire Area F is 13,542 Btu/ft^2 or 10.16 minutes. The NRC's approval of the exemption does reflect that the licensee indicates a 10-minute duration, but their conclusion indicates that the condition is acceptable because of "low fuel load"

Licensing Action 3: Fire Door 215 Equivalent Protection

(among other things). Times were calculated using a conversion factor of 80,000 Btu/ft^2 = 1 hour as stated in the NFPA Handbook, Table 18.1.1. Per walkdowns completed October 2010 and June 2011, these fire compartments have detection and are separated by Fire Door 215.

The NRC's approval of the exemption was based on a number of features taken together (i.e., "combination of factors"). Combustible loading in the room was just one of the factors. It was also that any fire would be detected quickly and that the brigade would respond quickly. They did not state that their approval was based on the fire duration being less than 10 minutes; rather they stated that it was based on "low fuel loading." While there is no standard industry definition for low combustible loading, it can still be argued that both the previous values and the current values both are still a fraction of an hour and thus still "low." Thus the exact fire loading values in the room can vary without exceeding our licensing basis as long as the fire severity can be considered low.

While the combustible loading values as currently calculated exceed the 10 minute duration, the hazards in the room have not changed. Door 215 is still expected to provide "reasonable assurance that one train of AFW pumps will remain free of fire damage." Thus DBNPS remains within the current design and licensing basis.

4. Door 215 has a fire resistance significantly longer than the maximum postulated fire duration.

   A fire severity of ~15 minutes (see Item 3 above) is less than the 25 minutes discussed in Item 2 above and less than the 3-hour fire rating for Door 215 evaluated in the Factory Mutual report attached to C-FP-013.06-023.

5. Fire areas E and F have smoke detection

   FHAR Section 4.6.E.4 states, "Fire Area E consists of Room 237 which has fire detection." Section 4.6.F.4 states, "Fire Area F consists of Room 238 which has fire detection (Fire Detection Zone 238)." Table 8-3 Fire Detection Systems spells out that four smoke detectors are installed in Fire Area E and F. Drawings A-222Fand E-892, Sheet 6, show four fire detectors in each room. Code compliance of detectors is discussed in LAR Attachment A in accordance with NFPA 805 Section 3.8.2.

6. The fire brigade response would be less than 25 minutes.

   Procedure DB-FP-00005, "Fire Brigade," includes Attachment 4, "Fire Brigade Drill Assessment." The acceptance criteria for the brigade's timely arrival include assembling at the scene of the simulated fire and commencing discussion of firefighting agent application within twelve minutes. A note states: "Elapsed time in excess of 15 minutes will be considered unsatisfactory drill performance."

Licensing Action 3: Fire Door 215 Equivalent Protection

In conclusion, although the information has been updated over time, the bases for previous acceptance are still valid, and the exemption for separation of redundant SSD components by a fire barrier having a 3-hour rating will be transitioned to the new licensing basis under NFPA 805.

Associations:

Ch. 4 - Compartment: E-01
Ch. 4 - Compartment: F-01
Fire Protection - Fire Compartment: E-01 / Form: Detection
Fire Protection - Fire Compartment: E-01 / Form: Passive Protection
Fire Protection - Fire Compartment: F-01 / Form: Detection
Fire Protection - Fire Compartment: F-01 / Form: Passive Protection

Licensing Action 4: Fire Compartments A-04 and A-05

An exemption has been approved from Section III.G.2 to the extent it requires separation of redundant SSD components by a 3-hour rated fire barrier. Specifically, Train 1 circuits in Rooms 123 and 124 are not separated from Train 2 circuits in Room 115 by a complete 3-hour rated barrier.

Basis Date: 04/18/1990

To Be Transitioned? No

Basis:

The licensee requested an exemption (Serial No. 1327) from Section III.G.3 of Appendix R because Fire Compartments A-04 and A-05 (Appendix R Fire Area A) do not comply with Section III.G.2. The separation is less than 20 feet between redundant trains of SSD equipment. After a request for additional information and a meeting with the NRC, DBNPS clarified the site's position in a follow-up letter, Serial No. 1361. The NRC stated in its exemption (Log No. 3219) the following information:

> *For Fire Area A (Item 4 of the table above), the licensee has requested an exemption from the requirement of Section III.G.2.a of Appendix R which requires in part that cables and equipment and associated nonsafety circuits of redundant trains be separated by a fire barrier having a 3-hour rating. While there are, in general, 3-hour fire barriers in Fire Area A between redundant circuits used to achieve and maintain hot shutdown conditions, there are a number of nonrated fire walls bounding some of the rooms within this subject area. Specifically, the Train 1 safe shutdown circuits in Room Nos. 123 and 124 are not completely separated from the Train 2 circuits in Room No. 115 by a 3-hour fire barrier.*
>
> *The licensee's basis for its request for an exemption for Fire Area A is that the present level of fire protection is acceptable since smoke and heat from a fire would have to travel between redundant circuits via a complicated path through locations which are partly protected by an automatic sprinkler system in order that a fire in the vicinity of one train could also damage the redundant train. This complicated path derives from the layout of Fire Area A which is a complex of a number of individual rooms encompassing more than one elevation within the plant.*

Fire Compartment	Description
A-04 and A-05	ECCS Pump Room 1-2 and Clean Waste Receiver Tank Room

Licensing Action 4: Fire Compartments A-04 and A-05

Reference Document

- FHAR, Revision 24, Fire Hazard Analysis Report
- Log No. 3219, Exemption dated April 18, 1990, "Exemption to 10 CFR Part 50, Appendix R, Section III.G & III.J"
- Serial No. 1327, January 12, 1987, untitled DBNPS letter to NRC, Attachment 1 titled "Exemption Requests From 10CFR50, Appendix R"
- Serial No. 1361, May 27, 1987, "Fire Protection - Request for Additional Information"

Evaluation:

The exemption (Log No. 3219) stated the following information:

On the basis of its review of the licensee's fire hazards analysis (FHA) and its on-site inspection of the subject fire area, the staff agrees with the licensee that there is presently an acceptable level of fire protection within Fire Area A.

Additionally, the licensee stated in its letter dated May 27, 1987, that if Train 1 systems were to be damaged by a fire in Room Nos. 123 and 124, the plant procedures would direct the plant operators to use the undamaged Train 2 systems in Room No. 115. Since Train 1 shutdown systems are relied upon in Fire Area A, the staff finds that these procedures transferring reliance to Train 2 provide further assurance that the safe shutdown capability will be maintained in the event of a fire in the subject area. On the basis that the plant operators are fully trained in the transfer procedures cited above, the staff finds that these procedures are acceptable and that there will be no confusion experienced by the operators in making the safe shutdown capability transfer.

During its review of the licensee's FHA, the staff identified a concern regarding a cable chase in the subject fire area which had a significant in-situ fire load but was not protected by an automatic fire suppression system. The licensee addressed this concern in its letter dated May 27, 1987 by stating that the cable trays in this chase were protected by: the trays' solid bottoms; a cover of fire resistant material (i.e. Kaowool); a fire detection system; and manual fire fighting equipment. Additionally, the licensee stated that the high fire loading is attributable to the small floor area of the chase. The staff finds that the licensee's responses in its letter of May 27, 1987 satisfy its specific concerns identified in its review of the Davis-Besse FHA. The staff further concludes that the licensee has demonstrated, as discussed above, that it can achieve and maintain a safe shutdown even if the subject area were to sustain fire damage.

Licensing Action 4: Fire Compartments A-04 and A-05

On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the application of the regulation requiring that cables and equipment of redundant trains in Fire Area A be separated by a 3-hour fire barrier is not necessary to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown of the plant).

Validation/Conclusions:

Fire Compartments A-04 and A-05 will be evaluated using the performance-based approach as identified in NFPA 805 Section 4.2.4. As such, the existing exemption will not be transitioned into the NFPA 805 license basis.

Associations:

None

Licensing Action 5: Fire Compartment AB-01

An exemption is requested from Section III.G.3 of Appendix R to 10 CFR 50 to the extent that it requires fixed fire suppression in an area where alternate shutdown capability is provided. Specifically, alternate shutdown capability is provided for circuits controlling ECCS Room Cooler Fans C31-1 and C31-2 within Fire Compartment AB-01 (portion of Appendix R Fire Area AB). The alternate shutdown capability is physically and electrically independent of Fire Compartment AB-01.

Basis Date: 04/18/1990

To Be Transitioned? No

Basis:

Fire Compartment AB-01 (portion of Appendix R Fire Area AB) consists of the DH Coolers Room 113, Hatch Area 113A, and ECCS Pump Room 105. According to the request for exemption (Serial No. 1327), the area consists of 2,589 ft^2 of floor area, with an in-situ combustible loading consisting primarily of cable insulation, grease, polyethylene, and small quantities of lube oil. The total combustible loading in the area is approximately 5,500 Btu/ft^2, which equates to an equivalent fire severity of four minutes. The fire area is bounded by reinforced concrete walls with a minimum thickness of 2 feet, a reinforced concrete ceiling with a thickness of 1.5 feet, and a reinforced concrete floor with a thickness of 3 feet. Existing fire protection capability in the area consists of an area-wide, early warning fire detection system that alarms locally and in the Control Room. Manual fire suppression capability in the form of portable fire extinguishers and standpipe hose stations is readily available in the area. For a fire in Appendix R Fire Area AB, Train 1 of the SSD systems is assumed to be lost, and Train 2 is used to ensure SSD.

The Compliance Assessment Report describes in detail the SSD analysis and consequent modifications performed to bring this fire area into compliance with Section III.G of Appendix R. In addition to these modifications, fire damage to certain circuits requires that alternate action be taken to ensure SSD capability. These circuits are associated with the ECCS Room Cooler Fans C31-1 and C31-2. Fire damage to the circuits would prevent the fans from operating. Alternate shutdown capability is provided by setting up temporary ventilation in Room 115. Adequate time exists to set up the portable fans before equipment in the area exceeds critical temperatures.

Fire Compartment	Description
AB-01	ECCS Room Cooler Fans

Licensing Action 5: Fire Compartment AB-01

Reference Document:

- FHAR, Revision 24, Fire Hazard Analysis Report
- Log No. 3219, Exemption dated April 18, 1990, "Exemption to 10 CFR Part 50, Appendix R, Section III.G & III.J"
- RFA 89-1852, "Room 115 ECCS Room Coolers"
- Serial No. 1327, January 12, 1987, untitled DBNPS letter to NRC, Attachment 1 titled "Exemption Requests From 10CFR50, Appendix R"

Evaluation:

An exemption from the requirements of Section III.G.3 to provide area-wide fixed fire suppression in Appendix R Fire Area AB was requested based upon the following evaluation in Serial No. 1327:

> *The equivalent fire severity in Fire Area AB is approximately 4 minutes, which consists of cable insulation, grease, polyethylene, and small quantities of lube oil. A fire originating in these combustibles and/or an assumed transient combustible is expected to produce a fire of insignificant magnitude. The installed early warning fire detection system will alert the Control Room operators to summon the fire brigade, which will respond and manually extinguish the fire. If the fire causes damage to the ECCS Room Coolers alternate shutdown capability is provided. This capability consists of manual operator actions.*
>
> *It is, therefore, Toledo Edison's position that a level of protection equivalent to Section III.G.3 of Appendix R to 10CFR50 is provided for Fire Area AB. The addition of a complete area-wide fixed suppression system to this area would not significantly enhance the level of fire protection provided for safe shutdown equipment.*

As indicated in the exemption (Log No. 3219), the staff found that the licensee demonstrated that the application of the regulation requiring a fixed fire suppression in Appendix R Fire Area AB was not necessary to achieve the underlying purpose of the rule (i.e., achieve and maintain a SSD of the plant) in accordance with 10 CFR 50.12(a)(2)(ii).

Validation/Conclusions:

This exemption is no longer required from the provisions of Appendix R III.G.3 to have full area suppression where credit is taken for an alternate shutdown capability. Fire compartment AB-01 was evaluated using the performance-based approach as identified in NFPA 805 Section 4.2.4. As such, the existing exemption will not be transitioned into the NFPA 805 license basis.

Licensing Action 5: Fire Compartment AB-01

Associations:

None

Licensing Action 6: Fire Compartment D-01

An exemption is requested from Section III.G.2 of Appendix R to 10 CFR 50 to the extent it requires the separation of redundant SSD equipment inside non-inerted containment (Fire Compartment D-01) by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. Specifically, Redundant Containment Air Cooler Fans C1-1, C1-2, and C1-3 are located within approximately 10 feet of each other.

Basis Date: 04/18/1990

To Be Transitioned? No

Basis:

Fire Compartment D-01 (Appendix R Fire Area D) is the Containment. The containment air coolers are located on the 585' elevation in Fire Zone D-15. Fire Zone D-15 consists of 3,410 ft^2 of floor area with an in-situ combustible loading consisting primarily of cable insulation and small quantities of grease and lube oil. The total combustible loading in the area is approximately 5,000 Btu/ft^2, which equates to an equivalent fire severity of four minutes. Existing fire protection capability in the area consists of ionization-type early warning fire detectors throughout Fire Zone D-15. Manual fire suppression capability in the form of portable fire extinguishers and standpipe hose stations is available for the area. Access to the Containment is restricted during plant operation due to high neutron dose levels. The Redundant Containment Air Cooler Fans C1-1, C1-2, and C1-3 are located side-by-side on the 585' elevation. The minimum separation distance between the fans is approximately 10 feet. As explained in the fire protection commitment revisions in DBNPS letter Serial No. 1757, one containment air cooler fan is required for SSD. The circuits associated with the fans will be protected with radiant energy heat shields.

The NRC approved the exemption (Log No. 3219) which states:

> *The staff agrees with the licensee that it has met the underlying purpose of the rule as discussed below. The licensee originally committed to protect the three circuits associated with these fans by radiant energy shields in its letter dated January 12, 1987. However, in its letter dated February 16, 1990, the licensee revised this commitment to protect only one of these circuits with a radiant energy shield in the containment and annulus and with a 1-hour barrier and fire suppression and detection systems or with a 3-hour fire barrier in the auxiliary building. This proposal to protect only one train of a system is in compliance with the requirements of Appendix R to 10 CFR Part 50 and is acceptable. With respect to the fan coolers themselves, the small fire loading in this area would result in a relatively minor equivalent fire severity of about 4 minutes in the fire zone where the fan coolers are located (i.e., Fire Zone D-15). Further, the configuration of this area would tend to dissipate smoke and hot*

Licensing Action 6: Fire Compartment D-01

gases away from the subject fan coolers in the event of a fire. Additionally, the metal cabinets enclosing the fans would shield the fans themselves from the radiant energy of a fire.

On this basis, we find that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the application of the regulation requiring that the subject equipment be separated by more than 20 feet is not necessary to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown of the plant).

Fire Compartment	Description
D-01	Containment Air Cooler Fans

Reference Document

- Log No. 3219, Exemption dated April 18, 1990, “Exemption to 10 CFR Part 50, Appendix R, Section III.G & III.J”
- Serial No. 1327, January 12, 1987, untitled DBNPS letter to NRC, Attachment 1 titled “Exemption Requests From 10CFR50, Appendix R”
- Serial No. 1757, February 16, 1990, “Fire Protection - Changes from Previous Submittals in Fire Protection Compliance Approaches”

Evaluation:

According to the exemption request (Serial No. 1327), the equivalent fire severity in Fire Zone D-15 is approximately four minutes. The RCPs located elsewhere in Containment are provided with an oil collection system. Due to the restricted access to Containment during operations, the accumulation of transient combustibles is not postulated. Any fire occurring in the area is therefore expected to be of insignificant magnitude. In addition, the metal cabinets enclosing the fans will provide a limited amount of heat shielding. If a fire were to occur in this area, the installed early warning fire detection system will alert the Control Room operators to summon the plant fire brigade. Due to the low combustible loading in the area, fire damage to both trains of containment air cooler fans is considered unlikely.

With the proposed installation of radiant energy shields between the redundant air cooler circuits, a level of protection equivalent to Section III.G.2 of Appendix R will be provided in Containment. Additional protection for the containment air cooler fans would not significantly enhance the level of protection provided for SSD equipment.

Licensing Action 6: Fire Compartment D-01

Validation/Conclusions:

This compartment will be evaluated using the performance-based approach as identified in NFPA 805 Section 4.2.4. As such, the existing exemption will not be transitioned into the NFPA 805 license basis.

Associations:

None

Licensing Action 7: Fire Compartment EE-01

An exemption has been approved from Section III.G.3 to the extent it requires area-wide fixed fire suppression in an area for which alternate shutdown capability is provided. Alternate shutdown capability is provided for circuits and electrical components for the Main Steam Inlet Isolation Valve MS106 for the AFPT 1. The alternate shutdown capability (Motor-Driven Feedwater Pump) is physically and electrically independent of Fire Compartment EE-01 (Appendix R Fire Area EE).

Basis Date: 04/18/1990

To Be Transitioned? No

Basis:

Section III.G.3 requires that alternate or dedicated shutdown areas be provided with fixed fire suppression systems. Fire Compartment EE-01 (Appendix R Fire Area EE) is not provided with a fixed suppression system. The NRC exemption (Log No. 3219) dated April 18, 1990, states, “Fire Area EE has an alternative shutdown capability in Fire Area II which is physically and electrically independent for potential fire damage to either the circuits or electrical components of the MS106 main steam inlet isolation valve for auxiliary feedwater pump turbine No. 1."

In a letter (Serial No. 1327) dated January 12, 1987, the following attributes were provided:

1. The fire severity in the area will only be eight minutes.
2. There is low in-situ combustible loading in the area.
3. The cable insulation is slow-burning with a gradual rise in room temperature with significant quantities of smoke.
4. The fire brigade will be dispatched and use manual firefighting equipment to suppress a fire.
5. The walls, floors, and ceilings are 3-hour rated.
6. There is a partial sprinkler system covering at least 30% (Room 501) of the area, which would tend to minimize a fire.
7. There is an alternative shutdown capability for each of these three fire areas, which is both physically and electrically independent.

Licensing Action 7: Fire Compartment EE-01

The NRC also stated in the exemption (Log No. 3219) the following information:

The licensee also justifies its exemption request for these three fire areas based on the available fire protection.

The staff agrees with the licensee that fires of significant magnitude would not occur in the subject areas nor would they spread beyond the boundaries of these areas. As a result, the cables and/or components which provide the alternative shutdown capability for the equipment in these three fire areas, as discussed above, would not be damaged. The staff's basis is that the principal fire hazards in the subject areas are the insulation on the electrical cables. A fire involving cable insulation is characterized initially by slow burning with a gradual rise in room temperature and significant quantities of smoke. Since the combustion products would be detected by either the existing smoke detection systems or by the plant personnel, the fire brigade would be dispatched and suppress the fire using manual fire fighting equipment. Furthermore, the walls, floors and ceilings of these three fire areas are 3-hour fire barriers which would be effective in confining the effects of a fire to the area of its origin until the arrival of the fire brigade. Additionally, Fire Area EE has a partial sprinkler system covering at least 30 percent of the area which would tend to minimize a fire in this area. Moreover, as discussed above, there is an alternative shutdown capability for each of these three fire areas which is both physically and electrically independent, thereby permitting a safe shutdown to be achieved even if the subject areas were to sustain fire damage.

Fire Compartment	Description
EE-01	Auxiliary Building HVAC Rooms

Reference Document

- Log No. 3219, Exemption dated April 18, 1990, "Exemption to 10 CFR Part 50, Appendix R, Section III.G & III.J"
- Serial No. 1327, January 12, 1987, untitled DBNPS letter to NRC, Attachment 1 titled "Exemption Requests From 10CFR50, Appendix R"

Evaluation:

Based on the discussion above, the staff determined that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the application of the regulation requiring a fixed fire suppression in Fire Compartment EE-01 (Appendix R Fire Area EE) is not necessary to achieve the underlying purpose of the rule (i.e., achieve and maintain a SSD of the plant).

Licensing Action 7: Fire Compartment EE-01

Validation/Conclusions:

This compartment will be evaluated using the performance-based approach as identified in NFPA 805 Section 4.2.4. As such, the existing exemption will not be transitioned into the NFPA 805 license basis.

Associations:

None

Licensing Action 8: Manhole MH3001 Cable Separation

An exemption has been approved from the requirements for fire protection features for Fire Compartment MA-01 (Appendix R Fire Area MA), Manhole 3001, required by Section III.G.2.

Basis Date: 04/18/1990

To Be Transitioned? Yes

Basis:

Fire Compartment MA-01 (Appendix R Fire Area MA) does not comply with III.G.2 because the separation of redundant train cables is less than 20 feet, the area is not provided with an automatic suppression system, and it does not have fire detection coverage throughout the area. In an exemption dated April 18, 1990, (Log No. 3219) the NRC stated:

> *For manhole MH 3001 (Item 7 of the table above), the licensee has requested an exemption from the requirement of Section III.G.2.b that requires in part that cables and equipment and associated nonsafety circuits located in the same fire area outside of primary containment and necessary to achieve and maintain hot shutdown conditions be separated by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. Specifically, the licensee's request is with respect to redundant circuits in the subject manhole associated with the service water system, including pumps (P3-1, P3-2 and P3-3), the backup pump (P-180), valves (SW 1395 and SW 1399) and motor control centers (MCCs E12C and F12C), which are less than 6 feet from one another. This manhole has neither active nor passive fire protection features.*

Fire Compartment	Description
MA-01	Manhole 3001

Reference Document

- 3614-2-E-14Q, Revision 0, "Nuclear Engineering and Construction Specification"
- C-83, Revision 7, "Yard Structures Electrical Manholes Plans, Sections, and Details"
- CR 10-74188, "Review of Thermoplastic and Thermoset Cables Used at Davis-Besse"
- E-0309, Revision 9, Sheet 1, "Raceway & Grounding Manhole-Sections & Details"
- E-0326, Revision 23, "Underground & Embedded Raceway & Grounding Pump House El.562'-6" & 585'-0""

Licensing Action 8: Manhole MH3001 Cable Separation

- FHAR, Revision 25, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"

Evaluation:

In an exemption dated April 18, 1990, (Log No. 3219) the NRC stated the following:

> *The staff agrees with the licensee that there is a negligible potential for a fire which could damage redundant cables in this manhole in that there are no credible external sources of fire since the manhole is constructed with a concrete raised sill whose top opening is covered with a steel cap bolted into place. As a result, the only significant fire threat to the redundant cables is from a cable-induced fire within the manhole itself. With respect to this fire potential, the licensee stated in its exemption request that the insulation on the cables in this manhole satisfies the criteria of IEEE Standard 383-1974 or its equivalent. Accordingly, this material will not sustain combustion unless an external heat source is present. Since the redundant cables are separated in accordance with the guidance in Regulatory Guide 1.75 and the cables are protected against protracted fault conditions by overcurrent devices, the staff concludes that there is a negligible potential for a fire which could damage the redundant circuits.*
>
> *On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant cables in manhole MH 3001 need not be physically separated by more than 20 feet to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that there is negligible potential for a fire in the subject fire area.*

Validation/Conclusions:

Conformance with the Appendix R exemption agreements reached with the NRC regarding cable separation III.G.2 criteria, as stated in NRC exemption dated April 18, 1990, has been verified. The as-built plant configuration verification process consisted of review of current plant procedures, plant drawings, and the design change control process documentation.

As stated above, validation of the exemption criteria for this licensing action was performed by reviewing station-controlled procedures, drawings, and design control process documentation. Therefore, no walkdown of the areas evaluated was considered necessary.

Based on NRC exemption dated April 18, 1990, (Log No. 3219) the following criteria was selected for validation in order to carry this exemption forward:

Licensing Action 8: Manhole MH3001 Cable Separation

1. Manhole MH3001 is constructed with a concrete, raised sill whose top opening is covered with a steel cap bolted into place.

   - Review of Drawing C-83 confirms construction to include concrete, raised sill, with top opening covered with steel cap bolted into place.

2. The cables in MH3001 satisfy the criteria of IEEE Standard 383-1974 or equivalent.

   Review of SETROUTE Report dated 2012-04-03 for cables installed and pending for area MH3001 lists the cable types for the area. A comparison of those cable types to the Thermoset Thermoplastic Review performed for DBNPS indicates the cables are thought to be compliant with IEEE Standard 383. Discussions with the plant staff indicate the site procurement specification for Kerite cable requires it to be qualified to IEEE 383. However, an issue has been raised with regard to the actual qualification of the Kerite cable.

   - A review of cable codes was performed against the work previously done and captured in condition report CR 10-74188. Detailed documentation cannot be located for every cable code. Some cable codes can be traced to vendor documentation indicating that they passed the IEEE 383 flame testing. While for other cable codes, the jacket and insulation type (e.g., Hypalon and cross-linked polyethylene (XLPE)) are known through other vendor tests that the material has passed the flame testing considered to be "equivalent." If no data could be located or if it was known that this was likely not to pass (e.g., PVC), then it would not be considered "383 or equal." None of the cables reviewed in MH3001 were of this type. Thus the cables routed through MH3001 are considered IEEE 383 or equivalent.

3. The cables in MH3001 are separated in accordance with RG 1.75.

   - Nuclear Engineering and Construction specification number 3614-2-E-14Q includes the separation requirements and reference to RG 1.75. RG 1.75 endorses the electrical independence requirements of IEEE 384-1992, as shown on page three. MH3001 Drawings E-309 and E-326 were reviewed to verify the cable separation met the IEEE criteria. However, the visual inspection indicated that "unistrut" of > 1" is located between the trays. FENOC verified the evaluation that the physical arrangement observed actually complies with RG 1.75 separation requirements, which is documented in Action Item DB-1063.

Licensing Action 8: Manhole MH3001 Cable Separation

4. The cables in MH3001 are protected against protracted fault conditions by overcurrent devices.
   - Power cables in MH3001 were identified by a review of station drawings to confirm an installed breaker upstream of MH3001 cables.

     Instrument and control cables located in MH3001 have been identified by a review of station drawings to confirm the installation of fuses both upstream and downstream of the cables in MH3001.

     According to the FHAR Section 5.2.4, the interrupting device for each circuit within a common enclosure is adequately sized to perform its design function as part of the original plant design. The common power source analysis is in FHAR Section 5.1.

In conclusion, although the information has been updated over time, with acceptable resolution of the open items, the bases for previous acceptance will still be valid. The exemption for less than 20-foot separation of redundant train cables in an area not provided with an automatic suppression system and that does not have fire detection coverage throughout will be transitioned to the new licensing basis under NFPA 805.

Associations:

Ch. 4 - Compartment: MA-01
Fire Protection - Fire Compartment: MA-01 / Form: 20 ft. Separation

Licensing Action 9: Fire Compartment R-01

An exemption has been approved from Section III.G.3 to the extent that it requires fixed fire suppression in an area for which alternate shutdown capability is provided. Specifically, alternate shutdown capability is provided for circuits controlling the Service Water Pumps and AFPT Governor Valves within Fire Compartment R-01 (Appendix R Fire Area R). The alternate shutdown capability (in the form of the Backup Service Water Pump and the Motor-Driven Feedwater Pump) is physically and electrically independent of Fire Compartment R-01.

Basis Date: 04/18/1990

To Be Transitioned? No

Basis:

Fire Compartment R-01 (Appendix R Fire Area R) is the Auxiliary Shutdown Panel and Transfer Switch Room 324. The area consists of 350 ft^2 of floor area with an in-situ combustible loading consisting primarily of cable insulation and incidentals. The total combustible loading in the area is approximately 5,000 Btu/ft^2, which equates to an equivalent fire severity of four minutes. The fire area is bounded by 3-hour fire rated concrete and concrete-block walls with a minimum thickness of one foot, and 3-hour fire rated ceiling and floor constructed of 1-foot thick reinforced concrete. Existing fire protection capability in the area consists of an area-wide, early warning fire detection system that alarms locally and in the Control Room. Manual fire suppression capability in the form of portable fire extinguishers and standpipe hose stations is readily available in the area. For a fire in Room 324, both Train 1 and Train 2 are used to ensure SSD.

Modifications (MOD 84-0177) were required to bring this fire area into compliance with Section III.G of Appendix R. In addition to these modifications, fire damage to the circuits for the three Service Water Pumps could disable all three pumps. One Service Water Pump is required for SSD. Alternate shutdown capability is provided by manually aligning and starting the Backup Service Water Pump, located in Fire Compartment BD-01. Adequate time exists for the operators to perform these actions following a fire in Fire Compartment R-01. Fire damage to circuits for the Auxiliary Feedwater Pumps' Governor Control Valves ICS038A and ICS038B could disable their remote operability. Alternate shutdown capability is provided by manually aligning and starting the Motor-driven Feedwater Pump P-241 in Fire Compartment II-01. Adequate time exists for the operators to perform these actions following a fire in Fire Compartment R-01. DBNPS procedures include instructions for performing these manual actions if the aforementioned circuits are damaged by a fire in Room 324.

Licensing Action 9: Fire Compartment R-01

NRC letter dated April 18, 1990, (Log No. 3219) states:

For Items 1, 2 and 3 of the table above, the licensee has requested exemptions from the requirements of the last paragraph of Section III.G.3 of Appendix R which states in part that a fixed fire suppression system shall be installed in the area under consideration (i.e., Fire Areas R, EE and AB) in that an alternative shutdown capability and its associated circuitry is provided for each of these three areas. Specifically, Fire Area BD provides an alternative shutdown capability for the service water system in Fire Area R. Additionally, an alternative shutdown capability and its associated circuitry is provided in Fire Area II for the control valves of the turbine driven auxiliary pumps in Fire Area R….

The detailed description of the configuration of the three subject areas, including the construction of the perimeter boundaries, the potential fire hazards, and the available fire protection, is contained in the licensee's letter dated January 12, 1987, in its Fire Hazards Assessment Report (FHAR) and in the Davis-Besse Appendix R Compliance Assessment Report (CAR). Part of the licensee's basis for its request for exemptions for these three fire areas is the limited fire hazard in which the equivalent fire severity would range from 4 minutes in Fire Areas R and AB to 8 minutes in Fire Area EE. These relatively low equivalent fire severity times are due to the low in-situ combustible loadings in the subject areas. The licensee also justifies its exemption request for these three fire areas based on the available fire protection.

The staff agrees with the licensee that fires of significant magnitude would not occur in the subject areas nor would they spread beyond the boundaries of these areas. As a result, the cables and/or components which provide the alternative shutdown capability for the equipment in these three fire areas, as discussed above, would not be damaged. The staff's basis is that the principal fire hazards in the subject areas are the insulation on the electrical cables. A fire involving cable insulation is characterized initially by slow burning with a gradual rise in room temperature and significant quantities of smoke. Since the combustion products would be detected by either the existing smoke detection systems or by the plant personnel, the fire brigade would be dispatched and suppress the fire using manual fire fighting equipment. Furthermore, the walls, floors and ceilings of these three fire areas are 3-hour fire barriers which would be effective in confining the effects of a fire to the area of its origin until the arrival of the fire brigade…. Moreover, as discussed above, there is an alternative shutdown capability for each of these three fire areas which is both physically and electrically independent, thereby permitting a safe shutdown to be achieved even if the subject areas were to sustain fire damage.

Licensing Action 9: Fire Compartment R-01

On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the application of the regulation requiring a fixed fire suppression in Fire Areas R, EE and AB is not necessary to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown of the plant).

Fire Compartment	**Description**
R-01	Alternate Shutdown

Reference Document

- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Serial No. 1327, "Topic: Appendix R Exemption Requests, January 12, 1987"

Evaluation:

DBNPS letter (Serial No. 1327) states:

An exemption from the requirements of Section III.G.3 to provide fixed fire suppression in Fire Area R is requested, based upon the following evaluation:

The equivalent fire severity in Fire Area R is approximately 4 minutes, which consists of widely dispersed cable insulation and incidentals. A fire originating in these materials or a postulated transient combustible is not expected to produce a fire of significant extent or duration. The installed early warning detection system will alert the Control Room operators to summon the plant fire brigade, which will respond and manually extinguish the fire. If the fire causes damage to the Service Water System and/or the Turbine Driven Auxiliary Feedwater Pumps Governor Control Valves prior to intervention by the fire brigade, alternate shutdown capability is provided. This capability consists of manual operator actions to manually start the Backup Service Water Pump and/or Motor Driven Feedwater Pump.

It is, therefore, Toledo Edison's position that a level of protection equivalent to Section III.G.3 of Appendix R to 10CFR50 is provided for Fire Area R, the Auxiliary Shutdown Panel and Transfer Switch Room #324. The addition of a fixed fire suppression system to this area would not significantly enhance the level of fire protection provided for safe shutdown equipment.

Licensing Action 9: Fire Compartment R-01

Validation/Conclusions:

This exemption is no longer necessary as this compartment will be evaluated using the performance-based approach as identified in NFPA 805 Section 4.2.4. As such, the existing exemption will not be transitioned into the future license basis.

Associations:

None

Licensing Action 10: Emergency Lighting

An exemption has been approved from Section III.J to the extent it requires self-contained emergency lighting units with at least an 8-hour battery power supply in the areas needed for the operation of SSD equipment, and in access and egress routes thereto. The exemption is specifically to utilize existing “hard-wired” AC/DC essential lighting in portions of the Auxiliary and Turbine Buildings, and to utilize hand-held portable units in outside plant areas.

Basis Date: 04/18/1990

To Be Transitioned? No

Basis:

According to the NRC exemption (Log No. 3219):

The staff initially identified four specific concerns regarding this particular exemption request. In response to the first of these concerns, the licensee stated that the results of its own evaluation confirmed that the AC/DC lighting system in the pertinent portions of the auxiliary and turbine buildings which would be used in establishing an alternative method for achieving a safe shutdown in the event of a fire in either the control room or the cable spreading room, would not be disabled by a fire in either of these latter two locations. On the basis that there is an alternative means for achieving a safe shutdown with the existing AC/DC lighting systems in the event of a fire in either the control room or the cable spreading room, the staff finds that this concern has been resolved.

With respect to the staff's concern regarding the use of hand-held lighting units while conducting manual operations in outside plant areas, the licensee confirmed in Attachment 3 to its letter dated May 27, 1987 that no operator manual actions are required to achieve safe shutdown which would involve the use of both hands. On this basis, the staff finds this concern resolved. With respect to the third of the staff's concerns, the licensee also confirmed in its letter dated May 27, 1987 that the travel route of the operators is free from potentially hazardous conditions for those outside plant areas where operator action is required to achieve safe shutdown. On this basis, the staff finds this particular concern resolved.

The staff also expressed its concern that the illumination level in certain areas might not be sufficient to permit the plant operators to perform actions required to achieve a safe shutdown. In response, the licensee stated in its letter dated January 12, 1987, that a plant walkdown was performed to verify that there was adequate illumination within these areas for all activities which must be performed in the first 8 hours following the onset of a fire. This is also true for the access routes to these areas of concern. Following this plant walkdown, the licensee installed additional emergency lighting units and repositioned others. These modifications were performed consistent with *the guidance provided in Generic Letter 86-10, "Implementation of Fire Protection Requirements." On this basis, the staff finds that this last concern regarding emergency lighting is resolved.*

The staff agrees with the licensee that there is an acceptable method for providing emergency lighting in those portions of the auxiliary and turbine buildings that the plant operators must enter to achieve a safe shutdown in the event of a fire in either the control room or the cable spreading room. The staff also agrees with the licensee that there is an acceptable method for providing emergency lighting in outside plant areas. Finally, the staff also agrees that the modifications to the emergency lighting units cited above made in accordance with Generic Letter 86-10 are acceptable.

On the basis that the licensee has provided acceptable emergency lighting units for all areas, including the access routes, that plant operators must enter in the event of a fire, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that it meets the underlying purpose of the rule regarding emergency lighting.

Fire Compartment	**Description**
Various Fire Areas	Emergency Lighting

Reference Document

- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Serial No. 1327, "Topic: Appendix R Exemption Requests, January 12, 1987"

Evaluation:

The licensee stated in a letter dated January 12, 1987, (Serial No. 1327):

An exemption from the requirements of Section III.J to provide self-contained battery-powered lighting units in all areas needed for the operation of safe shutdown equipment is requested based upon the following evaluation:

For a fire occurring in either the Control Room or Cable Spreading Room that is of sufficient magnitude to require evacuation of the Control Room, Toledo Edison has developed an alternative shutdown procedure to ensure safe shutdown of the plant. This procedure may require the Control Room operators to man the alternate shutdown panel as well as several other stations through the plant. A circuit analysis has been performed to show that the essential AC/DC hard-wired lighting system would not be disabled by a fire in either the Control Room or Cable

Licensing Action 10: Emergency Lighting

Spreading Room. Several modifications were identified and are being implemented to ensure the availability of the "hard-wired" lighting circuits. In addition, the essential AC/DC hard-wired lighting system will provide illumination for at least 8 hours. Plant walkdowns have been performed to verify that the level of illumination produced by the combination of essential AC/DC hard-wired lighting systems and the battery-powered lighting unit system is adequate for the operators to perform the activities required by the alternate shutdown procedure.

For several outside plant areas, lighting will be supplied by hand-held units. These outside areas are discussed in Davis-Besse Appendix R Compliance Assessment Report. The portable lighting in outside areas can provide an equivalent level of lighting as a fixed lighting system. In addition, in outside areas, portable lighting provides greater flexibility than a fixed lighting system. Additionally, security lighting may be available to supply background lighting although this lighting system has not been evaluated for availability in the event of a fire.

Testing and maintenance of the essential AC/DC hard-wired lighting system will be performed under controlled procedures to provide a measure of reliability.

For a fire occurring in any plant area other than the Control Room and Cable Spreading Room, emergency lighting is provided by the battery-powered lighting system and handheld portable units for outside plant areas. Plant walkdowns have been performed to verify adequate illumination for all activities that must be performed in 8 hours. Additionally, security lighting may be available to supply background lighting although this lighting system has not been evaluated for availability in the event of a fire.

It is, therefore, Toledo Edison's position that a level of protection equivalent to Section III.J of Appendix R to 10CFR50 is provided by the essential AC/DC lighting system, as supplemented by self-contained 8-hour battery-powered lighting units and portable lighting units for outside areas. The addition of 8-hour battery-powered lighting units for complete coverage of all areas needed for the operation of safe shutdown equipment would not significantly enhance the level of safety provided for safe shutdown equipment.

Validation/Conclusions:

8-hour battery backed emergency lights are not a specific requirement of NFPA 805. This exemption (Section III.J of Appendix R) will not be transitioned to the new licensing basis under NFPA 805.

Associations:

None

Licensing Action 11: Embedded Conduits

An exemption has been approved from the requirement to have a rated 3-hour barrier separating embedded conduits in concrete from redundant trains of SSD circuits and associated circuits required by Section III.G.2.

Basis Date: 04/18/1990

To Be Transitioned? Yes

Basis:

In an exemption dated April 18, 1990 (Log No. 3219) the NRC stated the following:

For certain cables of electrical circuits which are enclosed in conduit and embedded in concrete walls, floors and ceilings (Item 8 of the table above), the licensee has requested an exemption from the requirement of Section III.G.2.a of Appendix R which requires in part that cables and equipment and associated nonsafety circuits of redundant circuits required to achieve a safe shutdown be separated by a fire barrier having a 3-hour rating. The subject cables were not evaluated by the licensee in its safe shutdown analysis for a fire. Moreover, the depth and configuration of the concrete covering these cables is insufficient in the event of a fire to meet the Appendix R requirement cited above. The licensee later submitted supplemental information regarding the subject exemption request in its letter dated September 30, 1989.

The licensee stated in the cited documents that it conducted a comprehensive effort to determine where potentially vulnerable cables were installed and to determine the depth and configuration of the concrete cover, the steel reinforcing bars and anchor bolts, all of which have an effect on the fire resistance of the reinforced concrete cover. The licensee determined in its analysis, using the standard heat input specified in ASME E-119, that if a fire were to occur in any of the subject areas, the temperature of the electrical cables would not exceed 310 degrees F in a 30-minute period. When active fire suppression activities begin after the arrival of the fire brigade, thereby removing the heat source, the licensee stated that the cable temperatures would continue to rise to a maximum of 370 degrees F and then diminish. The temperature-time profiles cited above were used as a reference to assess the adequacy of fire protection for the embedded cables in the subject fire areas.

The staff agrees with the licensee that 370 degrees F is an acceptable temperature limit below which significant fire damage to the electrical cables would not occur. Furthermore, the staff finds that this acceptance criteria is conservative in that the nature and configuration of the combustibles in the subject fire areas will produce a temperature-time profile which is lower than that derived when using ASTM E-119.

Licensing Action 11: Embedded Conduits

The licensee's analysis of the subject fire areas was divided into three categories when comparing the fire hazards with the existing fire protection in each portion of the subject fire areas. The first of these categories was those areas which had combustibles that would result in an equivalent fire loading less than 30 minutes. The staff finds the areas in this first category acceptable on the basis that an all consuming fire less than 30 minutes would not produce sufficient heat to damage the cables; i.e., the maximum possible cable temperature of 310 degrees F would be below the acceptance criterion of 370 degrees F.

In the second category, there are a number of fire areas having combustibles which would yield an equivalent fire loading greater than 30 minutes but which are also protected by automatic fire suppression systems. The staff finds the areas in this second category have an acceptable level of protection on the basis that the fire suppression systems in these areas would actuate automatically during the early stages of a fire.

There are two locations (i.e., Rooms 428 and 515) which have combustibles that would produce an equivalent fire loading greater than 30 minutes but which do not have automatic fire suppression systems. Based on our evaluation of the licensee's justification for not providing automatic suppression systems for these two rooms and on our inspection of these areas during August 1989, the staff agrees with the licensee that any potential fire in these two rooms would be suppressed by the plant fire brigade well before room temperatures reached a level high enough to cause cable damage.

Based on the validity and conservatisms in the licensee's heat transfer analyses of the protective cover over the embedded conduits in the subject areas and on the subsequent evaluation as discussed above, the staff concludes that the licensee has provided an acceptable level of fire protection for the subject fire areas. On this basis, the staff finds that the licensee has demonstrated, as required by 10 CFR 50.12(a)(2)(ii), that the subject redundant embedded cables need not have a 3-hour fire barrier to achieve the underlying purpose of the rule (i.e., achieve and maintain a safe shutdown) in that the reinforced concrete cover and other protective measures will limit the temperature rise in the embedded cables below the threshold of damage.

Licensing Action 11: Embedded Conduits

Fire Compartment	Description
A-08	No. 4 Mechanical Penetration Room
DF-01	No. 2 Electrical Penetration Room
DH-01	Main Steam Line Areas
EE-01	Auxiliary Bldg Ventilation Rooms
II-01	Turbine Building
Q-01	High Voltage Switchgear Room B
R-01	Auxiliary Shutdown Panel Room and Duct Chase
X-01	Low Voltage Switchgear-F bus and No. 1 Electrical Isolation Rooms

Reference Document

- A-224F, Revision 24, "Fire Protection General Floor Plan EL. 603'-0""
- A-225F, Revision 19, "Fire Protection General Floor Plan EL 623'-0""
- C-FP-013.10-006, Revision 4, "Combustible Loading Analysis"
- C-NSA-013.06-001, Revision 0, "Imbedded Conduit Heatup Due to Anchor Bolt Conduction"
- C-NSA-013.06-002, Revision 0, "PVC Conduit Heatup with Anchor Bolt"
- DB-FP-00005, Revision 7, "Fire Brigade"
- E-892, Revision 7, Sheet 2, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 623'"
- E-892, Revision 11, Sheet 4, "Raceway-Fire Alarm System Auxiliary Building Plan EL. 603'"
- E119-2000, "ASTM Standard Test Methods for Fire Tests of Building Construction and Materials"
- FHAR, Revision 25, "Davis-Besse Nuclear Power Station Unit 1 Fire Hazard Analysis Report"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- M-410, Revision 26, "HVAC Aux Bldg. Plan at Elevation 623'"
- NUREG/CR-6850, "Fire PRA Methodology for Nuclear Power Facilities, Vol 2: Detailed Methodology"

Licensing Action 11: Embedded Conduits

- Serial No. 1719, "Fire Protection - Appendix R Exemption Request Involving Conduits Embedded in Concrete, September 30, 1989"

Evaluation:

DBNPS letter dated September 30, 1989, (Serial No. 1719) states:

Certain circuits, required to achieve and maintain safe shutdown in the event of a fire, are enclosed in conduit and embedded in concrete walls, floors, duct banks or ceilings of the Davis-Besse Nuclear Power Plant. These circuits were evaluated in the safe shutdown analysis for a fire. It was identified that the existing fire protection features for the safe shutdown embedded circuits in Rooms 252, 314, 323, 324, 334, 427, 428, 430, 431, 501, 515, and 602 are not in accordance with the requirements of Section III.G of Appendix R to 10CFR50. However, as discussed below the fire protection features are sufficient to ensure one train of these circuits would be free of fire damage. An exemption is requested from Section III.G of Appendix R to 10CFR50, pursuant to 10CFR50.12, to obviate the need for modifying the existing fire protection features for these circuits embedded in concrete in Rooms 252, 314, 323, 324, 334, 427, 428, 430, 431, 501, 515, and 602….

Toledo Edison has evaluated the existing fire protection measures provided for embedded conduits in Rooms 252, 314, 323, 324, 334, 427, 428, 430, 431, 501, 515, and 602 and has determined that these measures provide a level of protection equivalent to Section III.G of 10CFR50, Appendix R. These measures are:

1. *An analysis of the worst case configuration (i.e., a minimum conduit embedment of 2 7/8 inches and anchor bolts in the concrete) was performed. The circuits' temperatures would not exceed 310 degrees F in 30 minutes. Once the heat source is removed or extinguished, the hottest temperature in the conduit will continue to rise to approximately 370 degrees F and then drop off. These temperatures are enveloped by the environmental qualification data for the cable used in the circuits embedded in these rooms/and thus the circuits will remain operable.*
2. *Rooms 252, 314, 323, 324, 334, 427, 430, 431, 501, and 602 either have a combustible loading of 30 minutes or less or are protected by an automatic sprinkler system. In those rooms with a combustible loading of 30 minutes or less, the passive protection of the concrete will maintain the circuits at an acceptable temperature and thus they will remain operable. In those rooms with a combustible loading of greater than 30 minutes and an automatic sprinkler system, the passive protection of the concrete and the active protection provided by the*

Licensing Action 11: Embedded Conduits

automatic sprinkler system will maintain the circuits at an acceptable temperature and thus they will remain operable.

3. *Room 428 has a combustible loading greater than 30 minutes and is not protected by automatic sprinkler systems. In this room the passive protection of the concrete will maintain the circuits at an acceptable temperature and thus they will remain operable. Room 428 is provided with fire detection zones which would alert Control Room personnel to a fire and they would initiate the response of the Fire Brigade. Within 30 minutes, the fire brigade would respond to extinguish the fire and the circuit temperature will remain at an acceptable temperature and thus they will remain operable.*
4. *Room 515 has a combustible loading greater than 30 minutes and is not protected by an automatic sprinkler system. However, ninety-five percent of the total combustible load is charcoal which is contained in three charcoal filters that are within heavy metal plenum boxes as part of the ventilation system. The charcoal has an extremely slow burn rate. Also it is reasonable to assume that only one of the charcoal filter plenums would be on fire at a time. Even though the combustible loading exceeds 30 minutes, the effect of any potential fire is very limited and the passive protection of the concrete will maintain the circuits at an acceptable temperature and thus remain operable.*
5. *The Davis-Besse Fire Brigade has a minimum shift size of five members and is onsite at all times in accordance with Technical Specification 6.2.2.f. The Fire Brigade does not include the members of the minimum shift crew's necessary for safe shutdown of Davis-Besse during a fire emergency. The Fire Brigade has established training programs and fire drills under existing administrative controls. Normal fire brigade response at Davis-Besse has been timed in drills at less than 15 minutes from alarm initiation to providing water on the fire.*
6. *Figure 7-8E of the NFPA Handbook, 16th Edition, indicates that 2 7/8 inches of concrete provides over 45 minutes of fire resistance. The analysis considered the impact of the anchor bolts which could reduce the fire resistance of the concrete. The analysis has a number of conservatisms that if removed from the calculation, would cause the fire resistance to approach the equivalent fire resistance of the concrete without considering the anchor bolts. The analysis is conservative for the following reasons:*
   a. *The heat input to the calculation was the ASTM E-119 time-temperature curve. The actual combustible loading in the rooms would not result in the assumed heatup rate.*

Licensing Action 11: Embedded Conduits

b. *The calculation assumed the anchor bolt is in direct alignment with the conduit and is the largest size normally allowed with a embedment of 2 7/8" or less. Actually, it is highly improbable that the anchor bolt is in direct alignment with the conduits or is near the conduits due to the small surface area of the conduit relative to the large surface area of the wall, floor, duct banks, or ceiling. Also the minimum conduit embedment is based on combining the minimum concrete cover and rebar sizes which are both not likely to occur where an anchor bolt is located.*

Consequently, Toledo Edison has determined that the existing fire protection features provided for the embedded conduits would ensure one train of equipment necessary to achieve and maintain safe shutdown in the event of a fire is free of fire damage and, thereby, provide an equivalent level of fire protection as required by Section III.G of Appendix R. Additionally, the imposition of additional modifications simply to satisfy the methods specified by Appendix R of 10CFR50 for the embedded conduit would not significantly enhance the level of fire protection currently provided.

Validation/Conclusions:

Conformance with the Appendix R exemption agreements reached with the NRC regarding cable separation; III.G.2 criteria, as stated in NRC exemption dated April 18, 1990, (Log No. 3219) has been verified. The as-built plant configuration verification process consisted of limited walkdowns combined with the review of current plant procedures, plant drawings, and the design change control process documentation.

Based on NRC exemption dated April 18, 1990, (Log No. 3219) the following criteria was selected for validation in order to carry this exemption forward:

1. Rooms 252, 314, 323, 324, 334, 427, 430, 431, 501, and 602 have either:

   a. A combustible loading of 30 minutes or less

   b. Area protected by an automatic sprinkler system

   The FHAR states rooms 252, 314, 334, 427, 430, 431, and 501 have an automatic sprinkler system. A walkdown was done in April 2011 and confirmed the following areas had no automatic sprinklers visible within Rooms 323, 324, and 602. However, from C-FP-013.10-006, the combustible loading of these rooms is: Room 323 is 25,879.07 Btu/ft^2, Room 324 is 2100 Btu/ft^2, and Room 602 is 3559.83 Btu/ft^2. Using the conversion factor of 40,000 Btu/ft^2 = 30 minutes, the three rooms have a combustible loading of less than 30 minutes.

Licensing Action 11: Embedded Conduits

2. Verify that, if Rooms 428 and 515 have a combustible loading of greater than 30 minutes and are not protected by automatic sprinkler systems, then the fire brigade is able to reach the rooms in less than 30 minutes and detection is available and alarms in the Control Room.

   Table 18.1.1 from the NFPA Handbook shows 40,000 Btu/ft^2 is the equivalent to a fire severity of approximately 30 minutes. The FHAR and C-FP-013.10-006 states Room 428 has a combustible loading of 46,507 Btu/ft^2 and does not have automatic wet sprinkler system. Room 515 has a combustible loading of 56,800 Btu/ft^2 and does not have automatic wet sprinkler system. Both rooms have a greater than 30 minute combustible loading.

   The procedure DB-FP-0005 includes Attachment 4, "Fire Brigade Drill Assessment." The acceptance criteria for the brigade's timely arrival include assembling at the scene of the simulated fire and commencing discussion of firefighting agent application within 12 minutes. A note states: "Elapsed time in excess of 15 minutes will be considered unsatisfactory drill performance." Drawings A-224F and E-892, Sheet 4, indicate fire detection (smoke detectors) is available in Room 428 and alarms in the Control Room. Drawings A-225F and E-892, Sheet 2, indicate fire detection is available in Room 515 and alarms in the Control Room. A walkdown to verify detectors were located within these rooms was conducted in April 2011. Code compliance of these detectors is discussed in LAR Attachment A, in accordance with NFPA 805 Section 3.8.2, for Compartments X-01 and EE-01.

2a. Verify that the combustible loading in Room 515 is three charcoal filters in heavy plenum boxes due to the slow burn rate of this component.

   Calculation C-FP-013.10-006 for Room 515 indicates a combustible load including, but not limited to, Charcoal Air Filters F17-1, F19-1, and F19-2. Filter F17-1 accounts for 30,240 Btu/ft^2, and Filters F19-1 and -2 account for 22,680 Btu/ft^2.

   Drawing M-410, "Heating-Ventilating & Air Conditioning Auxiliary Building Plan At El. 623'-0," shows Filters F-19-1 & F19-2 within "Emergency Vent. System Filter Units" and Filter F17-1 within "Containment Purge Exhaust Filters F-17, No. 1-1."

3. Verify that ASTM E119 time-temperature curves were used to determine that the circuits' temperatures would not exceed 310 degrees F in 30 minutes and after the heat source is removed the conduit temperature will continue to rise to approximately 370 degrees F then drop off.

   Per the ASTM E119 time-temperature curve, at 30 minutes the temperature is 1550 degrees F. However, this does not account for the heat transfer to embedded conduits. One analysis was found on the discussion of heat transfer to

Licensing Action 11: Embedded Conduits

embedded conduits, but it only discusses anchor or expansion bolts installed in a hole directly over a three-inch conduit embedded in four inches of concrete. Serial No. 1719 gives an explicit geometry of 2-7/8 inches (1-3/8 inches of rebar covered by 1-1/2 inches of concrete).

Calculation C-NSA-013.06-002 evaluated an anchor bolt directly above a PVC conduit with only 2-7/8" of cover. The maximum exterior temperature was approximately 481 degrees F at 40 minutes with a conduit internal temperature of 370 degrees F. It should be noted that air temperature inside the conduit climbed to 156 degrees F at 40 minutes.

Calculation C-NSA-013.06-001 evaluated an anchor bolt directly above a steel conduit with only 4" of cover. 300 degrees F is reached on the exterior conduit surface at approximately 30 minutes.

4. Verify that the temperatures noted in Number 3 above are enveloped by the EQ data for the cable used in the circuits embedded in these rooms.

   The failure temperature for cables is greater than the approximate 370 degrees F peak temperature. For thermoset cables, it is 625 degrees F, and for thermoplastic cables, it is 400 degrees F (Ref. NUREG 6850, Volume 2, Att. H, Page H-1). Failure temperature is 702 degrees F for Kerite Cables (Ref. NUREG 6850, Volume 2, Att. H, Page H-6). One analysis was found on the discussion of heat transfer to embedded conduits, but it only discusses anchor or expansion bolts installed in a hole directly over a three-inch conduit embedded in four inches of concrete. Serial Number 1719 gives an explicit geometry of 2-7/8 inches (1-3/8 inches of rebar covered by 1-1/2 inches of concrete).

5. Verify the DBNPS fire brigade has a minimum shift size of five members and is onsite at all times in accordance with TS 6.2.2.f. Also, verify that the fire brigade does not include the members of the minimum shift crew necessary for SSD of DBNPS during a fire emergency. Verify the fire brigade is able to respond in 30 minutes or less.

   DB-FP-00005, "Fire Brigade," Section 4.7, “Fire Brigade,” states:

   > *The Team consists of one Fire Captain and four brigade members who are not relied upon for safe shutdown essential functions in the event of a fire emergency.*

   Section 6.1.1, “Fire Brigade Requirements” states:

   > *The Fire Brigade is composed of a minimum of five individuals: one captain and four brigade members. This staffing is maintained on site at all times. The brigade composition may be less than the minimum requirements for a period of time not to exceed two hours in order to accommodate unexpected absence, provided immediate action is taken to fill the required positions.*

Licensing Action 11: Embedded Conduits

The procedure includes Attachment 4, "Fire Brigade Drill Assessment." The acceptance criterion for the brigade's timely arrival includes assembling at the scene of the simulated fire and commencing discussion of firefighting agent application within twelve minutes. A note states: "Elapsed time in excess of 15 minutes will be considered unsatisfactory drill performance."

In conclusion, although the information has been updated over time, the bases for previous acceptance are still valid and the exemption to have a rated 3-hour barrier separating embedded conduits in concrete from redundant trains of SSD circuits and associated circuits will be transitioned to the new licensing basis under NFPA 805.

Associations:

Ch. 3 - Section: 3.11 / Subsection: 3.11.1
Ch. 4 - Compartment: A-08
Ch. 4 - Compartment: DF-01
Ch. 4 - Compartment: DH-01
Ch. 4 - Compartment: EE-01
Ch. 4 - Compartment: II-01
Ch. 4 - Compartment: Q-01
Ch. 4 - Compartment: R-01
Ch. 4 - Compartment: X-01
Fire Protection - Fire Compartment: DF-01 / Form: Water-Based Suppression
Fire Protection - Fire Compartment: II-01 / Form: Water-Based Suppression
Fire Protection - Fire Compartment: X-01 / Form: Detection

Licensing Action 12: Reactor Coolant Pumps Oil Collection System

RCP Oil Collection System

Section III.O of Appendix R to 10 CFR 50 requires, in part, that the RCP lube oil collection system be designed to collect lube oil leakage in a closed, vented container that can hold the entire lube oil system inventory.

An exemption has been approved from Section III.O to the extent it requires the oil collection system for the RCPs be capable of containing the oil from the four RCPs. The oil collection system is capable of collecting the oil from two RCPs.

RCP Remote Oil Fill System

An exemption has also been granted to use the remote fill system without a collection system. The underlying purpose of 10 CFR Part 50, Appendix R, Section III.O, is to ensure that leaking oil will not lead to a fire that could damage SSD systems during normal or design basis accident conditions.

Basis Date: 08/20/1984

01/30/1998

To Be Transitioned? Yes

Basis:

RCP Oil Collection System

In the exemption dated August 20, 1984, (Log No. 1586) the staff states:

> *The Davis-Besse Nuclear Power Station is designed with two reactor coolant loops. Each loop has two reactor coolant pumps (RCP). A high pressure and low pressure lube oil system is provided for each RCP motor. The high pressure system is used only during startup and shutdown. The low pressure system is used during normal operation. Each RCP motor contains 225 gallons of lube oil.*
>
> *The licensees have provided one 250 gallon oil collection tank for each loop. This provides sufficient capacity to hold the total lube oil inventory of only one RCP motor in each loop with some margin. Any lube oil overflow will drain to the containment sump. The RCP motor lube oil system does not comply with Section III.O because the oil collection tank is not sized to contain the entire lube oil system inventory.*
>
> *Since any lube oil overflow will drain to the containment building sump where there is no other flammable material or hot surfaces which may ignite the oil, the overflow oil will not present an exposure fire hazard to or otherwise*

Licensing Action 12: Reactor Coolant Pumps Oil Collection System

endanger safety-related equipment, and since the RCP motor lube oil collection system is capable of withstanding the safe shutdown earthquake, we find the oil collection system acceptable.

Based on our evaluation as discussed above, we conclude the existing RCP motor lube oil collection system provides a level of safety equivalent to the technical requirements of Section III.O and, therefore, the exemption requested is granted.

RCP Remote Oil Fill System

The RCP motor lube oil system does not comply with Section III.O because the oil collection tank is not sized to contain the entire lube oil system inventory. Section III.O of Appendix R to 10 CFR Part 50 requires that the licensees have a collection system "capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the RCP lube oil systems." It also specifies that "leakage points to be protected shall include lift pump and piping, overflow lines, lube oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and lube oil reservoirs where such features exist on the RCPs." The underlying purpose of 10 CFR Part 50, Appendix R, Section III.O, is to ensure that leaking oil will not lead to a fire that could damage SSD systems during normal or design basis accident conditions.

In an exemption dated Jan 30, 1998, (Log No. 5205) the NRC stated the following:

On the basis of the enclosed Safety Evaluation, the NRC staff concluded that the design of the oil filling system and the level of protection provided by the licensees through the use of certain compensatory measures during oil fill operations provides reasonable assurance that a lube oil fire will not occur. The compensatory measures, as itemized in the licensees' November 18, 1997, exemption request, are:

(1) The licensees will take the following compensatory actions each time oil is added:

(a) Oil will be added only when a low oil level computer alarm is received on an RCP motor.

(b) Only a predetermined amount of oil necessary to clear the alarm (approximately three pints based on experience) will be initially added to the reservoir through the remote fill line. A maximum total volume of four pints may be added in an attempt to clear the alarm.

(c) The oil fill pot will be verified empty before the technician leaves the immediate area. Any spillage resulting from adding oil to the remote oil fill pot will be cleaned up.

Licensing Action 12: Reactor Coolant Pumps Oil Collection System

(d) Personnel responsible for adding the oil will be instructed to report (to the control room) any evidence of smoke during the oil addition process. If smoke is seen, the fire brigade will be immediately dispatched to the area.

(2) In addition, a visual inspection will be conducted following refueling outages to confirm the integrity of the remote fill line system.

The staff also concluded that a worst-case postulated fire, from not having a lube oil collection system for the RCP lube oil fill lines, would be of limited magnitude and extent. In addition, the staff concluded that such a fire would not cause significant damage in the containment building and would not prevent operators from achieving and maintaining safe shutdown conditions. Accordingly, in light of the foregoing, the staff concluded that application of this collection system requirement is not necessary to achieve the underlying purpose of the rule.

Fire Compartment	Description
D-01	RCP Oil Collection

Reference Document

- DB-MM-01013, Revision 5, "Mechanical Maintenance Procedure Lubricant Addition"
- Log No. 1586, "Exemption From Certain Requirements of Appendix R to 10CFR50"
- Log No. 5205, "Issuance of Exemption from the Requirements of 10 CFR Part 50, Appendix R"
- M-040D, Revision 18, "Piping & Instrument Diagram Reactor Coolant pump & Motor"
- M-103-65, Revision 6, "RC Pump Motor Oil Drain Tank (T156-1 & T156-2)"
- M-508-00058-07, Revision 7, "Reactor Coolant Pump Motor Part I of III"
- PM 0056, "SPV MP36-1 *Oil Lift* RCP #1-1"
- PM 0057, "SPV MP36-2 *Oil Lift* RCP #1-2"
- PM 0058, "SPV MP36-3 *Oil Lift* RCP #2-1"
- PM 0059, "SPV MP36-4 *Oil Lift* RCP #2-2"

Licensing Action 12: Reactor Coolant Pumps Oil Collection System

- Serial No. 991, "Topic: Appendix R Exemption Requests, September 30, 1983"
- Serial No. 2493, "Request for Exemption from 10 CFR 50, Appendix R, Section III.O, Oil Collection System for Reactor Coolant Pumps"

Evaluation:

RCP Oil Collection System

By letter dated September 30, 1983, (Serial No. 991) DBNPS requested an exemption from 10 CFR 50 Appendix R Section III.O for the RCP oil collection system. An exemption was requested from the requirement for the RCPs collection system to be capable of collecting lube oil from leakage sites in the RCP lube oil system. The current system is in compliance with Section III.O, except for the ability to collect oil from both pumps that serve a single reactor coolant loop.

The DBNPS existing RCP oil collection system design meets the overall intent of 10 CFR 50, Appendix R, Section III.O in that no single failure of the RCP lubricating oil system will lead to a fire during normal operations or design basis accident conditions. Upgrading of the current RCP lube oil collection system to collect the total capacity (450 gallons) of both pumps would not enhance to a significant degree the protection provided by the current system. Therefore, DBNPS requests an exemption for the capacity requirements of RCP oil collection system.

RCP Remote Oil Fill System

By letter dated November 18, 1997, (Serial No. 2493) an exemption from the requirements of 10 CFR Part 50, Appendix R, Section III.O, regarding oil collection systems for reactor cool ant pumps was requested. The letter states:

The remote oil fill lines are of a leak-tight design, and are only used infrequently. A hypothetical worst case oil spill and ignition will not impact post-fire safe shutdown capability. Administrative controls will be established to minimize the potential for an oil fire due to a leak from the portions of the remote oil fill line that are not enclosed by an oil collection system.

Based on the above, the underlying purpose of Appendix R, Section III.O, which is to ensure that leaking oil will not lead to a fire which could damage safe shutdown systems during normal or design basis conditions, is accomplished without the installation of' an oil collection enclosure around the remote oil fill lines.

The granting of this exemption request would have no impact on plant radiological or nonradiological effluents and involves no significant radiation exposure.

Licensing Action 12: Reactor Coolant Pumps Oil Collection System

Validation/Conclusions:

Conformance with the Appendix R exemption agreements reached with the NRC for the RCP oil collection system, as stated in NRC exemption dated August 20, 1984, has been verified. Validation of the NRC exemption criteria was performed by review of station records as identified below. Validation findings support transition of the exemption. The as-built plant configuration verification process consisted of review of current plant procedures, plant drawings, and the design change control process documentation. A walkdown of the system was not necessary in order to verify the current design configuration of the systems adequately.

Based on NRC exemption dated August 20, 1984, (Log No. 1586) the following criteria was selected for validation in order to carry this exemption forward:

1. Each RCP motor contains 225 gallons of oil or less.
   - Review of the vendor manual, M-508-00058, “RCP Motor Part I of III,” confirms that each motor has an upper bearing oil pot capacity of 200 gallons and a lower bearing oil pot of 25 gallons, for a total volume of 225 gallons of oil.
2. Each RCP oil collection tank has a volume of 250 gallons.
   - Review of Drawing M-103-65-6, “3600 RC Pump Motor Oil Drain Tank,” confirms that each tank has an approximate fluid volume of 250 gallons.
3. The RCP oil collection tank configuration is such that only two RCP motors are connected to each tank.
   - Review of Drawing M-040D, “Piping & Instrument Diagram Reactor Coolant Pump & Motor,” confirms that the oil collection tank configuration is such that only two RCP motors are connected to each tank.

In conclusion, although the information has been updated over time, the bases for previous acceptance are still valid, and the exemption for the RCP oil collection system will be transitioned to the new licensing basis under NFPA 805.

Conformance with the Appendix R exemption agreements reached with the NRC to use the remote fill system without a collection system, as stated in NRC exemption dated January 30, 1998, has been verified. Validation of the NRC exemption criteria was performed by review of station records as identified below. Validation findings support transition of the exemption. The as-built plant configuration verification process consisted of the review of current plant procedures, plant drawings, and the design change control process documentation. A walkdown of the system was not necessary in order to verify the current design configuration of the systems adequately.

Licensing Action 12: Reactor Coolant Pumps Oil Collection System

Based on NRC exemption dated January 30, 1998, (Log No. 5205) the following compensatory measures were selected for validation in order to carry this exemption forward:

1. Oil will be added only when a low oil level computer alarm is received on an RCP motor.
   - Review of Procedure DB-MM-01013 confirms that "Oil may only be added when a computer low level alarm is received."
2. Only a predetermined amount of oil necessary to clear the alarm (approximately 3 pints, based on experience) will be initially added to the reservoir through the remote fill line. A maximum total volume of four pints may be added in an attempt to clear the alarm).
   - Review of Procedure DB-MM-01013 confirms that "A maximum of 4 pints may be added to clear the low oil alarm (typically 3 pints is adequate)."
3. The oil fill pot will be verified empty before the technician leaves the immediate area. Any spillage resulting from adding oil to the remote oil fill pot will be cleaned up.
   - Review of Procedure DM-MM-01013 confirms that "The oil fill pot shall be verified empty and any spillage wiped up, prior to leaving the immediate area."
4. Personnel responsible for adding the oil will be instructed to report (to the Control Room) any evidence of smoke during the oil addition process. If smoke is seen, the fire brigade will be immediately dispatched to the area.
   - Review of Procedure DB-MM-01013 confirms that "Evidence of smoke (caused by the oil addition process) shall be reported to the Control Room. The Fire Brigade should be dispatched immediately."
5. A visual inspection is conducted following refueling outages to confirm the integrity of the remote fill line system.
   - Review of PMs 0056, 0057, 0058, and 0059 confirm that the following are included as part of a post-maintenance inspection, "Inspect the lower reservoir and associated piping for leakage" and "Inspect the RCP oil collection system piping and storage tanks for external oil leakage. Clean up any traces of oil."

In conclusion, although the information has been updated over time, the bases for previous acceptance are still valid and will be transitioned to the new licensing basis under NFPA 805.

Associations:

Ch. 3 - Section: 3.3 / Subsection: 3.3.12

Licensing Action 12: Reactor Coolant Pumps Oil Collection System

Ch. 3 - Section: 3.3 / Subsection: 3.3.12(1)
Ch. 3 - Section: 3.3 / Subsection: 3.3.12(2)
Ch. 3 - Section: 3.3 / Subsection: 3.3.12(4)
Ch. 3 - Section: 3.3 / Subsection: 3.3.12(5)
Ch. 4 - Compartment: D-01
Fire Protection - Compartment: D-01 / Form: Detection

Licensing Action 13: Cold Shutdown Within 72 hours - Withdrawn

The exemption for cold shutdown within 72 hours was withdrawn. See TR Section 2.2 for details.

Licensing Action 14: Fire Compartment HH-01

An exemption has been approved from Section III.G.3 to the extent it requires full, fixed, fire suppression and automatic detection in an area for which alternate shutdown capability is provided. The alternate shutdown capability is physically and electrically independent of Fire Compartment HH-01 (Appendix R Fire Area HH), according to NRC Letter (Log No. 6317), "Exemption from the requirements of 10 CFR 50, Appendix R, Section III.G.3," July 21, 2005.

Basis Date: 07/21/2005

To Be Transitioned? No

Basis:

The licensee requested an exemption (Serial No. 1327) from Section III.G.3 of Appendix R that requires that alternate or dedicated shutdown areas be provided with fixed fire suppression systems. Specifically, Fire Compartment HH-01 (Appendix R Fire Area HH) is not provided with a fixed suppression system.

By letter dated April 18, 1990, (Log No. 3219) the NRC concluded that the exemption for Fire Area HH was not required because Generic Letter (GL) 86-10, "Implementation of Fire Protection Requirements," allowed performance-based evaluations for satisfying the applicable requirements of Appendix R. A later NRC inspection disputed that view, and a subsequent exemption was requested in Serial No. 3003.

An exemption dated July 21, 2005, (Log No. 6317) contains the following:

> *The licensee is requesting an exemption from the requirements of Section III.G.3 to provide area-wide fire detection and fixed fire suppression in Fire Area HH. Control room emergency ventilation systems are routed through Fire Area HH in the auxiliary building. Fire Area HH is equipped with a fire detection system (covering approximately 96 percent of Fire Area HH), but no fixed suppression system is installed.*
>
> *In summary, FENOC has requested an exemption from the 10 CFR Part 50, Appendix R, Section III.G.3 requirement for a fixed fire suppression system in Fire Area HH and for fire detection in the approximately 4 percent of Fire Area HH not equipped with a fire detection system.*

Fire Compartment	Description
HH-01	Control Room AC Equip. Room

Licensing Action 14: Fire Compartment HH-01

Reference Document

- Serial No. 1327, "Topic: Appendix R Exemption Requests, January 12, 1987"
- Log No. 3219, "Exemption to 10CFR50, Appendix R, Section III.G & III.J"
- Log No. 6317, "Exemption from the requirements of 10 CFR 50, Appendix R, Section III.G 3"
- Serial No. 3003, "Request for Exemption from 10 CFR 50, Appendix R, Section III.G.3 for Fire Area HH"

Evaluation:

Per NRC letter dated July 21, 2005, (Log No. 6317) the NRC staff examined the licensee's rationale to support the exemption request and concluded that adequate DID and safety margins exist. Although fixed suppression is not installed in the area, the configuration of the area makes it unlikely that the cables of interest will be damaged by a fire in the area. Also, if the cables of interest are damaged, adequate assurance remains to demonstrate that the plant can be brought to a SSD condition.

The NRC staff concluded that application of the regulation is not necessary to achieve the underlying purpose of the rule and that the requested exemption was acceptable, and in accordance with 10 CFR 50.12(a)(2)(ii).

Validation/Conclusions:

This compartment will be evaluated using the performance-based approach as identified in NFPA 805 Section 4.2.4. As such, the existing exemption will not be transitioned into the future license basis.

Associations:

None

L. NFPA 805 Chapter 3 Requirements for Approval (10 CFR 50.48(c)(2)(vii))

33 Pages Attached

Approval Request 1

NFPA 805 Section 3.3.5.1 states:

> *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.*

DBNPS is requesting approval for limited use of low power data and communication cables above suspended ceilings which are neither plenum-rated nor routed in armored cable, metal conduit, or trays with metal covers. The cable installation meets the intent of NFPA 805, Section 3.3.5.1.

Basis for Approval Request 1:

As part of the transition to risk-informed performance-based regulation, DBNPS examined NFPA 805, Chapter 3 requirements for installations above suspended ceiling.

Suspended ceilings are used sparingly throughout the power block at DBNPS. LAR Attachment I, "Definition of Power Block," lists the areas included in the power block. Within the DBNPS power block, suspended ceilings are in the following fire areas:

- CC-01, Old RRA Access and Chemistry Lab Areas
- FF-01, Control Room Complex
- FF-02, Control Room Study Room
- FF-03, Control Room Kitchen

With the exception of the Control Room Complex (FF-01) and Old RRA Access and Chemistry Lab Areas (CC-01), the other areas with suspended ceilings are not risk-significant, nor do they contain systems and equipment essential to address nuclear safety performance criteria. Area walkdowns identified a number of cable types routed above ceilings in CC-01 only. Other areas (FF-01, FF-02, and FF-03) do not have non-rated, non-enclosed cables routed above suspended ceilings.

The cables above the suspended ceilings in CC-01 are data and communication cables. Also included above the suspended ceilings are type CMP cable that is plenum-rated; therefore, it is not within the scope of this approval request. A condition exists in CC-01 where power supply wiring for Emergency Backup Lighting is non-enclosed and routed above the suspended ceiling. This single instance of non-enclosed 120V power wiring is being tracked for resolution in LAR Attachment S action item, DB-2020.

The wiring in CC-01 located above suspended ceilings that is non-enclosed or non-plenum-rated does not pose a significant hazard due to the following:

- The cables routed above suspended ceilings include data and communication cable. These are low power cables; therefore, unlikely to carry sufficient electrical energy for self-ignition.
- It is common practice to consider only self-ignited cable fires to occur in medium to high voltage cables since they carry electrical energy sufficient for self-ignition Control and instrumentation cables do not carry enough electrical energy for self-ignition.

- In the absence of an ignition source, it is unlikely for a significant fire event to originate in the space above the suspended ceilings that would be capable of challenging nuclear safety performance criteria. Fixed ignition sources located in the space above suspended ceilings are limited to small hazards such as low voltage lighting.
- Cables in CC-01 used for safe shutdown are routed in metallic conduit; therefore, they are protected from the low power data and communication and other cables.
- Cables at DBNPS are classified according to level of service. Medium power cables capable of self-ignition are grouped separately from low power, control and instrument cables which lack sufficient energy to self-ignite.
- Low power cables located above ceilings, serving data or communication systems, are not required to achieve nuclear safety performance criteria.
- Process documents are being revised to ensure future cable installations at DBNPS will meet NFPA 805-2001, Section 3.3.5.1. This is being tracked in LAR Attachment S action item, DB-1964.

Acceptance Criteria Evaluation:

Nuclear Safety and Radiological Release Performance Criteria:

The location of non-enclosed or non-plenum rated low power data and communication cable above the suspended ceiling of CC-01 does not pose a significant fire hazard. The low power cable is not susceptible to shorts that would result in a fire and does not constitute an ignition source capable of challenging nuclear safety. Cables performing a nuclear safety function are routed and protected in metallic conduit in this space. Therefore, the presence of non-plenum-rated cables located above suspended ceilings does not affect nuclear safety performance criteria.

The presence of non-plenum-rated cables located above the suspended ceiling of fire compartment CC-01 has no impact on fire suppression activities, nor impact on radiological release performance criteria. The radiological review was performed based upon the potential location of radiological concerns and is not dependent on the type of wiring or location of suspended ceilings. The cables do not change the results of the radiological release evaluation that concluded potentially contaminated water is contained and smoke is monitored. The cables do not add additional radiological materials to the fire compartment. The existing use of non-enclosed or non-plenum-rated low voltage wiring above suspended ceilings at DBNPS has no impact on nuclear safety and radiological release performance criteria.

Safety Margin and Defense-in-Depth:

The non-enclosed or non-plenum rated low power data and communication cable above suspended ceilings carry insufficient energy to self-ignite. Such cables do not compromise automatic or manual fire suppression functions nor adversely impact safety margin given the absence of a credible ignition source and the low likelihood of occurrence of fire. The cables have been analyzed in their current configuration. The amount of non-rated and non-enclosed cable above the ceiling in CC-01 is minor and does not present a significant fire hazard. In addition, the cable used for nuclear safety are routed and protected in metallic conduit. Therefore, the safety margin inherent in the analysis for the fire event has been preserved.

Defense-in-depth (DID) protects public health and safety from radioactive or hazardous material releases resulting from a fire event. Multiple independent and redundant echelons of DID offset potential human errors and mechanical failures so that no single echelon, no matter how robust, is exclusively relied upon. The three echelons of fire protection DID include the following:

(1) To prevent fires from starting (combustible/hot work controls).

(2) Rapidly detect, control and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, and pre-fire plans).

(3) Provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable, success path remains free of fire damage, and recovery actions).

Per NFPA 805, Section 1.2, DID is achieved when an adequate balance of each of these elements is provided. At DBNPS, the subject low power data and communication cable does not carry sufficient energy to self-ignite, which prevents potential fires from starting and preserves DID echelon 1. Procedure changes ensure future cable installations above suspended ceilings will be listed for plenum use or enclosed per NFPA 805, Section 3.3.5.1, to support DID echelon 1.

In the low likelihood event of a fire, pre-fire plans provide guidance for a well-trained and regularly-drilled Fire Brigade to promptly respond to the emergency. Fire extinguishers and hose stations are located within or readily accessible from nearby fire areas, preserving DID echelon 2.

Finally, the DBNPS fire program provides robust fire barriers and circuit separation of redundant trains of essential safety related equipment that preserve one train free of fire damage to enable safe shutdown of the plant and preserve DID echelon 3. Limited fixed ignition sources and the low potential energy in the exposed non-shutdown data and communication cables located above the suspended ceiling make it unlikely for a significant fire event to originate in the space above the suspended ceilings. In the unlikely event of a fire, it would not be capable of challenging the cable contained in the metallic conduits that support the nuclear safety performance criteria, which further supports echelon 3.

The low power data and communication cable routed above suspended ceilings does not directly result in compromising automatic fire suppression systems, manual fire suppression functions, or post-fire safe shutdown capability. Each of these elements in balance achieves DID and supports a margin of safety at DBNPS.

Conclusion:

NRC approval is requested for the use of low power data and communication cable that is non-enclosed or non-plenum-rated above the suspended ceilings in CC-01. Cables used to meet the nuclear safety performance criteria of NFPA 805 located above the CC-01 suspended ceiling are few in number and enclosed in metallic conduit. This conduit effectively separates the safety-related cable from the negligible hazard posed by the low voltage, non-enclosed cable. Non-enclosed or non-plenum-rated low power data and communication cable above suspended ceilings at DBNPS is acceptable.

DBNPS determined that the performance-based approach satisfies the following criteria:

- Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release,
- Maintains safety margins, and
- Maintains fire protection DID (fire prevention fire detection, fire suppression, mitigation, and post-fire safe and stable capability).

Approval Request 2

NFPA 805 Section 3.3.5.3 states:

Electrical 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 is.

NFPA 805, Section A.3.3.5.3 states:

Electric cable insulation should be of a type that has been tested using a recognized flame spread test. An example of such a test is IEEE 817, "Standard Test Procedure for Flame-Retardant Coatings Applied to Insulated Cables in Cable Trays," and IEEE 1202, "Standard for Flame Testing of Cables for Use in Cable Tray and Industrial and Commercial Occupancies."

DBNPS is requesting approval for recognition that the type of cable insulation used throughout the plant meets the intent of NFPA 805, Section 3.3.5.3.

Basis for Approval Request 2:

NFPA 805, Section 3.3.5.3 requires electric cables to comply with flame propagation tests as found acceptable by the AHJ. NFPA 805, Appendix A explains acceptable test types as IEEE 817 and IEEE 1202. FAQ 06-0022, "Acceptable Electrical Cable Construction Tests," clarifies Section 3.3.5.3 of NFPA 805 to refer generally to IEEE 383-1974 or IEEE 1202-1991 as the NRC accepted test standards for flame propagation.

Cables installed as part of the original construction of DBNPS predate the issuance of IEEE 383. NRC review in "Safety Evaluation of Fire Protection Measures at the Davis-Besse Nuclear Power Station, Unit No. 1, Per Appendix R to 10 CFR Part 50 (TAC Nos. M60994, M60995, M61745 and M61923)" (Log No. 3480) states that alternative testing measures were used to qualify cables, and further states:

…based on the levels of fire protection (e.g., fire detection, fire suppression and fire barriers) provided for safe shutdown systems and hazardous areas as described in the FAOR, Revision 1 and subsequently in Revision 12 of the FHAR, the staff concludes that this deviation is acceptable.

Cable insulation material can be classified into two main types: thermoset and thermoplastic. Thermoset materials char and retain their shape when heated, limiting fire growth along the material extruded as cable insulation. Thermoplastic materials melt and burn when heated, and have lower failure temperatures than thermoset materials per NUREG-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities." Typically, the IEEE 383 qualified cables have thermoset insulation material, while the unqualified cables are constructed of thermoplastic insulation material (NUREG-1805, Ch. 7). The majority of the cables in trays at DBNPS are equivalent to qualified cables because they have thermoset insulation that limits fire propagation along the cable.

The thermoset insulated cables in cable trays at DBNPS account for over 90% of the cables. Less than 6% of the cables in trays at DBNPS were categorized as thermoplastic (PVC or Teflon) insulated. Approximately 4% of the cables were conservatively assumed to be thermoplastic insulated because the actual insulation type could not be determined. DBNPS also has cables manufactured by Kerite, which do not perform as well under fire conditions as other thermoset insulated cables. These cables are included as thermoset insulated cables and are included as input to fire modeling as part of the NFPA 805 project.

The thermoplastic (PVC) insulated cables identified by the DBNPS Condition Report 10-74188 are used in low voltage applications for process and area radiation monitors, the GAI-Tronics system, and in original construction for the television circuits. These low power instrumentation cables do not carry enough electrical energy for self-ignition (NUREG-1805, Ch. 7). These cables were found only in non-essential trays and are routed separately from safety-related cables.

Cables in conduit are not a concern, as cables in conduit do not significantly contribute to fire spread because they are enclosed, have limited oxygen, and less surface area for fire spread. Cables in conduit are not considered as ignition sources and typically do not contribute to fire growth and spread (NUREG-6850, Appendix H).

Acceptance Criteria Evaluation:

Nuclear Safety and Radiological Release Performance Criteria:

Thermoplastic insulated cables are used primarily in non-safety and low voltage applications; therefore, they are not considered an ignition source. The thermoplastic (PVC) insulated cables identified by the DBNPS Condition Report 10-74188 were found only in non-essential trays. These cables are routed separately from safety-related cables. In the event of an externally initiated fire that may ignite these cables, the separation will minimize the potential of flame spread to safety-related cables. Therefore there is no impact on the nuclear safety performance criteria.

The radiological review was performed based on the potential location of radiological concerns and is not dependent on the type or location of thermoplastic cables. The results of the radiological release evaluation concluded that potentially contaminated water is contained and smoke is monitored. The thermoplastic cables do not add additional radiological materials to the areas or challenge systems boundaries. Therefore, non-qualified thermoplastic cable currently in use at DBNPS has no impact on radiological release performance criteria.

Safety Margin and Defense-in-Depth:

Thermoset insulation is used in the majority of cables in the plant. This type of insulation will char and retain its shape when heated, limiting flame propagation. The thermoplastic insulated cables account for less than 10% of all cables within the plant, with the majority of these thermoplastic cables being low-voltage and non-safety related. Damage to these thermoplastic cables is not expected to impact safety-related cables due to cable separation. Flame spread to adjacent cable trays in high density safety-related areas is also reduced by the use of solid-bottom trays with a layer of ceramic fiber on top. The detailed fire models as well as the probabilistic risk assessment incorporated the information from DBNPS Condition Report 10-74188 to identify and account for thermoplastic cable impacts. Therefore, the safety margin inherent in the analysis for the fire event has been preserved.

The three echelons of DID are:

(1) To prevent fires from starting (combustible/hot work controls)

(2) Rapidly detect, control and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans)

(3) Provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable, success path remains free of fire damage, recovery actions)

Per NFPA 805, Section 1.2, DID is achieved when an adequate balance of each of these elements is provided.

Thermoplastic insulated cables are used primarily in non-safety and low voltage applications and are not considered an ignition source. Therefore, echelon 1 is met through plant fire prevention procedures and is not affected by use of non-qualified thermoplastic cable. These cables do not affect echelons 2 or 3 because they are found only in non-essential trays and are routed separately from safety-related cables. The use of these thermoplastic insulated cables do not directly result in compromising automatic fire suppression systems, manual fire suppression functions, or post-fire safe shutdown capability. Since a balance of the elements is provided, DID is achieved.

Conclusion:

NRC approval is requested for the use of non-IEEE 383/1202 (or equivalent) thermoplastic cables. The majority of cables used throughout DBNPS are insulated with thermoset material, which chars and retains its shape when heated, limiting flame spread; therefore, the cables meet the intent of IEEE 383-1974 qualification. The thermoplastic cables account for less than 10% of the total cables in trays, are used primarily for low-voltage, non-safety related instrumentation, and are routed separately from cables for safety-related systems. Evaluations demonstrate that this small population of thermoplastic electrical insulated cable meets the performance criteria for nuclear safety and radioactive release, safety margin, and DID as stated above. Future cable installations at DBNPS will meet the established acceptance criteria of NFPA 805-2001, Section 3.3.5.3.

DBNPS determined that the performance-based approach satisfies the following criteria:

- Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release,
- Maintains safety margins, and
- Maintains fire protection DID (fire prevention fire detection, fire suppression, mitigation, and post-fire safe and stable capability).

Approval Request 3

NFPA 805 Section 3.3.12(1) states:

The oil collection system for each reactor coolant pump shall be capable of collecting lubricating oil from all potential pressurized and non-pressurized leakage sites in each reactor coolant pump oil system.

NFPA 805 Section 3.3.12(4) states:

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 exists on the reactor coolant pumps.

Approval is requested for DBNPS reactor coolant pumps (RCP) oil collection systems (OCS) from the requirements of NFPA 805, Section 3.3.12(1) and 3.3.12(4) to the extent that RCP oil misting is not captured within the originally approved OCS 10 CFR 50, Appendix R review.

Basis for Approval Request 3:

The DBNPS reactor coolant system (RCS) is configured with two reactor coolant loops. The RCPs are not safety related. There are a total of four RCPs; thus redundancy is provided. Each reactor coolant loop is partitioned at various levels by reinforced concrete walls. A single reactor coolant loop contains two RCPs, a steam generator, and associated piping. An OCS is constructed of oil drip pans with spray shields and enclosures surrounding the RCP lubricating oil system. This design is intended to prevent the RCP lubricating oil system from becoming a potential ignition source by collecting oil leakage.

Appendix R, Item III.O of 10 CFR Part 50 requires that the RCPs be equipped with an OCS to mitigate the fire hazard associated with the RCP lubricating system. DBNPS installed an enclosure surrounding the oil cooler, fill pipe, and bearing lift pump. Each of the reactor coolant loops has a single oil collection tank located and sized to handle the total lube oil inventory from only one of the two RCP motors in that loop. The enclosures are segmented and gasketed to facilitate disassembly and motor maintenance. The enclosures are designed to contain oil from leak or a pipe failure and drains to a vented collection tank. During normal operation, small quantities of viscous oil collect on the enclosure gaskets.

Vibration and thermal movement allows nominal weeping of the gaskets producing periodic oil drips. The quantity of oil is not sufficient to be considered significant leakage. In the event of significant leakage or pipe failure, the force of gravity readily exceeds the viscosity of the oil to ensure the captured lubricant is directed to the collection tank. Insignificant quantities of residual oil are expected to cling to the enclosures, gaskets and drain piping.

The OCS collection tank is periodically emptied to assure adequate capacity for the oil contained in one RCP motor. The exposed piping which is not encapsulated by the OCS enclosure is either not pressurized (e.g., it is a drain pipe) nor sleeved. Any lube oil overflow in excess of a single RCP lube oil inventory, will drain to the monitored containment sump and be detected by a change in sump level. The RCP OCS is seismically supported and has been designed to accommodate the differential movement of the reactor coolant loops. DBNPS Serial No. 991 documents the previously accepted exemption request for the OCS design. Log Number 1586 documents the NRC's acceptance of the exemption request as follows:

> *c) Exemption from Section III.O*
>
> *Section III.O of Appendix R to 10 CFR 50 requires, in part, that the reactor coolant pump lube oil collection system be designed to collect lube oil leakage in a closed, vented container that can hold the entire lube oil system inventory. The licensees have requested exemption from this requirement.*
>
> *The Davis-Besse Nuclear Power Station is designed with two reactor coolant loops. Each loop has two reactor coolant pumps (RCP). A high pressure and low pressure lube oil system is provided for each RCP motor. The high pressure system is used only during startup and shutdown. The low pressure system is used during normal operation. Each RCP motor contains 225 gallons of lube oil.*
>
> *The licensees have provided one 250 gallon oil collection tank for each loop. This provides sufficient capacity to hold the total lube oil inventory of only one RCP motor in each loop with some margin. Any lube oil overflow will drain to the containment sump.*
>
> *The RCP motor lube oil system does not comply with Section III.O because the oil collection tank is not sized to contain the entire lube oil system inventory.*
>
> *Since any lube oil overflow will drain to the containment building sump where there is no other flammable material or hot surfaces which may ignite the oil, the overflow oil will not present an exposure fire hazard to or otherwise endanger safety-related equipment, and since the RCP motor lube oil collection system is capable of withstanding the safe shutdown earthquake, we find the oil collection system acceptable.*
>
> *Based on our evaluation as discussed above, we conclude the existing RCP motor lube oil collection system provides a level of safety equivalent to the technical requirements of Section III.O and, therefore, the exemption requested is granted.*

The RCP OCS was designed and was reviewed in accordance with 10 CFR Part 50, Appendix R, Section III.O and Section C.7.a(1)(e) of BTP CMEB 9.5-1 to collect leakage from pressurized and non-pressurized leakage sites in the RCP oil system. The DBNPS RCP OCS's design and installation was approved for DBNPS in the NRC exemption approval request identified as Log 1586, dated August 20, 1984. The license approval did not discuss the collection of oil mist as a result of pump/motor operation.

Remote oil fill lines were added in 1990 to facilitate the addition of oil at power from a low-dose location to the lower oil reservoir of each RCP. The fill lines terminate within the approved OCS enclosure for the lower reservoir, above the normal oil level, to eliminate the potential for oil leakage during normal operation. The fill lines are devoid of oil except when the fill operation is conducted; therefore, the single wall tubing is not sleeved. Centerior Energy letter of November 18, 1997 (Serial No. 2493) includes compensatory measures to be implemented each time oil is added via remote oil fill lines including the following:

- *"Oil may be added only when a low oil level computer alarm is received on an RCP motor.*
- *Only a predetermined amount of oil necessary to clear the alarm (approximately three pints based on prior experience) will be initially added to the reservoir via the remote oil fill line. A maximum total volume of four pints of oil may be added in an attempt to clear the alarm.*
- *The oil fill pot will be verified empty prior to exiting the immediate area. Any spillage resulting from adding oil to the remote oil fill pot will be cleaned up.*
- *Personnel responsible for the oil addition evolution will be instructed to report to the control room any evidence of smoke during the oil addition process. If smoke is visually detected, the fire brigade will be immediately dispatched to the area.*
- *A visual inspection will be conducted following refueling outages to confirm the integrity of the remote oil fill line system."*

The exemption request letter concludes:

> *"The remote oil fill lines are of a leak-tight design, and are only used infrequently. A hypothetical worst case oil spill and ignition will not impact post-fire safe shutdown capability. Administrative controls will be established to minimize the potential for an oil fire due to a leak from the portions of the remote oil fill line that are not enclosed by an oil collection system.*
>
> *Based on the above, the underlying purpose of Appendix R, Section III.O, which is to ensure that leaking oil will not lead to a fire which could damage safe shutdown systems during normal or design basis conditions, is accomplished without the installation of an oil collection enclosure around the remote oil fill lines."*

NRC letter of January 30, 1998 (Log No. 5205) approved the exemption stating:

> *"Accordingly, the commission hereby grants an exemption from the requirements of 10 CFR Part 50, Appendix R, Section III.O, to the extent that the RCP lube oil fill lines are required to be protected with a collection system. The granting of this exemption is conditioned upon the licensees' use of the compensatory measures set forth in the licensees' November 18, 1997 exemption request."*

The RCP OCSs are designed and sized to collect and contain oil from pressurized and non-pressurized potential leakage areas in a seismic event resulting in failure of the lubrication system and have been previously approved in NRC letter of January 30, 1998 (Log No. 5205):

> *"Accordingly, the commission hereby grants an exemption from the requirements of 10 CFR Part 50, Appendix R, Section III.O, to the extent that the RCP lube oil fill lines are required to be protected with a collection system. The granting of this exemption is conditioned upon the licensees' use of the compensatory measures set forth in the licensees' November 18, 1997 exemption request."*

RCP motors are large and will consume oil during the course of normal operation. During normal operation, some of the lost oil will vaporize due to heat and is pushed out of motor seals. As the warm air from the motor combines with oil that has vaporized, it becomes oil mist. Therefore, the phenomena of oil misting is not leakage due to equipment maloperation, but a condition inherent in the design and proper operation of large rotating equipment. It is normal for large motors to lose some oil through seals and for the oil to potentially become "atomized" into the air circulating the motor for cooling. This atomized oil mist is then transported and can collect on surfaces in the vicinity of the RCP/motor as its design does not provide complete sealing in order to allow airflow for cooling. This oil mist then travels into the Reactor Containment (RC) atmosphere until it subcools into small drops or comes into contact with cooler surfaces. The quantity of oil lost through misting resulting from normal operation will not adversely impact the ability of a plant to achieve and maintain safe shutdown (SSD) even if ignition occurs.

The previously approved OCS design cannot contain this mist because the system is not designed to completely enclose the motor since adequate air circulation for safe motor cooling is required. The quantity of oil that may be found in areas of the containment due to the RCP oil vapor mist is very small and does not contribute to any significant fire loading nor create potential fire propagation potential between fire compartments. SD-039A, "System Description for Reactor Coolant System for First Energy Nuclear Operating Company Davis-Besse Nuclear Power Station Unit 1," states that, "the Reactor Coolant Pump Motor is a totally enclosed squirrel cage induction motor with thermalastic [sic] epoxy VPI (vacuum pregnated insulation) and an air-to-water heat exchanger to cool the ventilating air." Despite this, the release of oil vapor (oil misting) cannot be prevented unless the RCP motor bearing seals design is changed. A design change of this nature for motors of this size would be a significant modification and would result in little, if any, change in fire risk in the RC fire compartment.

The RCP, including the oil system, is seismically designed and the nearby hot surfaces of the RCS piping are protected by seismically designed mirror insulation such that any spilled lube oil would contact only outer surfaces of the insulation, which have temperatures below the lube oil flash point. It is also demonstrated by engineering design that sump and splash shields would be capable of preventing a fire during normal and design basis accident conditions. Therefore, the safety objective of 10 CFR 50, Appendix R, Section III.O would be achieved.

In addition, Generic Letter 86-10, "Implementation of Fire Protection Requirements," dated April 24, 1986, Question 6.2 (presented below) discussed oil dripping. The response concluded that there was no concern with oil consumption (which is an oil misting phenomena) but the primary concern was with an oil fire started from a pressurized leakage point and/or spilled leakage.

Question 6.2 states:

> *It would appear that a literal reading of Section III.O regarding the oil collection system for the reactor coolant pump could be met by a combination of seismically designed splash shields and a sump with sufficient capacity to contain the entire lube oil system inventory. If the reactor coolant pump is seismically designed and the nearby piping hot surfaces are protected by seismically designed splash shields such that any spilled lube oil would contact only cold surfaces, does this design concept conform to the requirements of the rule?*

The response states:

> *If the reactor coolant pump, including the oil system, is seismically designed and the nearby hot surfaces of piping are protected by seismically designed splash shields such that any spilled lube oil would contact only cold surfaces, and it could be demonstrated by engineering analysis that sump and splash shields would be capable of preventing a fire during normal and design basis accident conditions, the safety objective of Section III.O would be achieved. Such a design concept would have to be evaluated under the exemption process. The justification for the exemption should provide reasonable assurance that oil from all potential pressurized and unpressurized leakage points would be safely collected and drained to the sump. The sump should be shown capable of safely containing all of the anticipated oil leakage. The analysis should verify that there are no electric sources of ignition.*

Historically, there have been no fires attributed to oil misting based on normal operation in the industry. Fires have occurred due to oil leakage from equipment failure such as cracked welds on piping or inadequate collection pan design. DBNPS does not have a history, since its licensing for commercial operation was issued on April 22, 1977, of significant oil loss from the RCPs as a result of oil misting or oil leakage that is not contained by the properly designed and installed oil leakage collection system. Additional crediting factors include:

- The OCS as designed complies with 10 CFR 50, Appendix R Section III.O and was approved to collect leakage from pressurized and non-pressurized leakage sites in the RCP oil system.
- Oil misted from normal operation is not leakage; it is normal motor oil consumption.
- Oil drips and nominal oil weeping from gasketed connections and access covers of the OCS during normal operation does not constitute significant leakage.
- Oil misting and gasket weeping during normal operation does not significantly reduce the oil inventory.

- The oil released as misting does not account for an appreciable heat release rate or accumulation near potential ignition sources or non-insulated reactor coolant piping.
- The RCPs use synthetic oil having a high flash point in excess of 392°F per the manufacturer's specifications for the oil defined in Lubrication Data Package for these RCPs. The flash point temperature is well above the maximum expected surface temperature [less than 200°F] of any of the mirror insulation and other small components with which the vaporized oil will come in contact.
    - Specification No. M-197N, Section 5.1 defines the RCS cold leg coolant to have a design temperature of approximately 550°F at full power.
    - The Detailed Heat Loss Calculation on the Metal Reflective Insulation System for the Steam Generator Replacement Project identifies that the bounding primary side design temperature of 600 °F yields an outer insulating surface temperature of less than 200 °F with no air flow. The predicted surface temperature is further reduced when air flow is accounted.
- Although there are redundant RCPs and they are not required to achieve or maintain fire SSD, they are available during fire scenarios.
- RCPs for each loop are located in separate spaces (rooms) within reactor containment and are separated from adjacent compartments by rated fire barriers.
- RCPs are protected by early warning smoke detection. The fire detection alarms are received in the Control Room which is constantly attended.

Acceptance Criteria Evaluation:

Nuclear Safety and Radiological Release Performance Criteria:

The nuclear safety performance criteria are met because RCPs are available as necessary, and the RCPs are not required to achieve or maintain post-fire SSD.

The radiological release performance criteria are met because (1) the containment vessel during power operations is an environmentally sealed radiological area, (2) the potential for oil mist from the RCPs does not change the radiological release evaluation performed for each fire zone where potentially contaminated water and smoke is contained and monitored, (3) the oil mist does not add additional radiological materials to the area or challenge systems boundaries that contain such materials, and (4) the fire brigade control of water runoff and smoke is not hindered because of the existence of the misting.

Safety Margin and Defense-in-Depth:

RCP oil mist resulting from normal operation will not adversely impact the ability of the plant to achieve and maintain fire safe shutdown, even if ignition occurs. There are redundant RCPs available as necessary, and RCPs are not required to achieve and maintain safe and stable conditions. Therefore, the safety margin inherent in the analysis for the fire event has been preserved.

The three echelons of DID are:

(1) To prevent fires from starting (combustible/hot work controls)

(2) Rapidly detect, control and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, and pre-fire plans)

(3) Provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable, success path remains free of fire damage, and recovery actions)

Per NFPA 805 Section 1.2, DID is achieved when an adequate balance of each of these elements is provided.

Echelon 1 is maintained by the OCS and by the RCP motor design, and is not affected by this configuration. The introduction of small amounts of oil misting does not affect Echelons 2 and 3 as oil misting will not serve as either an ignition source or a secondary combustible. Furthermore, Echelon 3 is preserved by the redundant reactor coolant loop. The oil misting does not result in compromising fire detection, manual fire suppression functions, or post-fire safe shutdown capability. Since a balance of the elements is provided, DID is achieved.

Conclusion:

NRC approval is requested for the potential of oil misting from the DBNPS RCPs/motors since the normal consumption of oil is not captured by the RCP OCS, which is designed for pressurized and non-pressurized leakages and spillage. As discussed above, oil misting does not create an ignition source within the reactor containment building or require a modification to the previously approved 10 CFR 50, Appendix R, Section III.O RCPs. No fires have occurred in the DBNPS RC as a result of RCP oil misting since it was licensed for commercial operation on April 22, 1977.

DBNPS determined that the performance-based approach satisfies the following criteria:

- Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release,
- Maintains safety margins, and
- Maintains fire protection DID (fire prevention fire detection, fire suppression, mitigation, and post-fire safe and stable capability).

Approval Request 4

NFPA 805 Section 3.5.5 states:

> *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.*

DBNPS is requesting approval for the remote start circuit separation configuration of the remote control circuits to each fire pump.

Basis for Approval Request 4:

The remote start circuit cables deviate from NFPA 805, Section 3.5.5 because the circuits for the electric fire pump and the diesel fire pump are not separated from each other by rated fire barriers throughout their routing. The design is in conformance with the NFPA code of record, NFPA 20-1974, “Standard for the Installation of Centrifugal Fire Pumps,” and the previous BTP 9.5-1 licensing commitments for the pump circuits having electrical separation. The configuration is considered to meet the intent of NFPA 805, Section 3.5.5 based on the following:

- In the event that both sets of remote start cables are damaged and impair both fire pumps’ starting circuits, it would not affect the ability to perform an emergency start of the pump.
- In the event of a fire, Procedure DB-OP-02529, “Fire Procedure,” requires communication between the Control Room and Fire Brigade. This communication would expedite manual starting of the electric fire pump in the event that both fire pump automatic starting circuits were inoperable. The plant is also provided with alternate means of manual suppression via fire extinguishers to contain the fire while the electric fire pump is being manually locally started. An offsite fire department pumper may also be used to supply fire water when needed and is detailed within procedure DB-OP-06610, “Station Fire Suppression Water System.”

DBNPS has an electric fire pump, P5-1, and a diesel-driven fire pump, P5-2, which supply the yard loop that serves structures included within the Power Block and outlying buildings. Each of these pumps is a 100% capacity pump capable of supplying the largest sprinkler system. Additional water supplies capable of supplying the fire suppression system are the portable diesel-driven fire pump and the cross-tie with the Carol Township municipal supply.

The two pumps are located in separate fire rated compartments, and each pump has its own independent water supply. The electric fire pump is located in Fire Compartment BH-01, and the diesel engine driven pump is located in Fire Compartment BE-01. The fire pumps are designed to start automatically with a drop in water pressure in the event of a suppression system actuation or from the use of a fire hose in manual firefighting.

Remote control switches for starting the electric and diesel fire pumps are provided in the Main Control Room (MCR) and in Fire Compartment FF-01 on C5720. The cables associated with the switches leave the MCR and enter the Cable Spreading Room (CSR), Fire Compartment DD-01, through penetrations in the floor of the MCR before going to their respective pump. The circuits are routed through the same rooms for the majority of the routing. They were installed as separate channels and are not routed through the same raceways. The circuits are routed through cable trays except in two instances where each of the two cable paths are not in cable trays and are routed in conduits (the longest conduit run being 55' and for a total of 90' of conduit in the greater than 600' of total cable length). Where the trays are in the same rooms, the electrical trays are configured with solid bottoms with a layer of ceramic fiber blanket on the top.

For the electric fire pump circuit, the remote start cable is routed from the remote start pushbutton on the MCR panel to the pump's control panel via cable CCBEF41G, which is routed through Fire Compartments FF-01, DD-01, BG-01, and BH-01. A fire that causes an open circuit on this cable would have no effect on the automatic operation of the pump. A fire that causes an open or short in the cable would either start the pump or have no effect on the automatic operation of the pump. A fire that causes a short-to-ground on the cable could result in the loss of the pump's starting circuits. However, it would not affect the ability to perform an emergency start of the pump (DB-OP-06610, Section 5.1).

The pump is powered from the non-essential 480VAC switchgear. The offsite power supply could be lost due to a fire in various compartments. Except for a fire in Fire Compartments FF-01 and DD-01, the other compartments where the electric fire pump circuits are routed, a loss of offsite power is not expected. Therefore, it is assumed that power to the electric fire pump will not be lost in these compartments.

For the diesel fire pump start circuit, the fire pump remote start cable is routed from the MCR via cable ACFD02A per E-49B, Sheet 43, "Elementary Wiring Diagrams, Treated Water Systems, Fire Water Diesel Pump Auxiliary," which is routed through Fire Compartments FF-01, DD-01, BG-01, and BE-01. This control circuit cable is the only external field cable for the engine driven pump, other than a battery charger cable and an annunciator cable, which are not required for engine operation. The starting batteries are assumed to be initially charged.

With the start switch in its normal (auto) position, the starting circuit is energized through 24 volt Battery 2 and circuit breaker CB2 and auto contact of the control switch. In event of a ground fault on the start pushbutton circuit of sufficient current, CB2 would trip, and relays would pick up and energize the start circuit through Battery 1 and CB1. If the fault were still present, this would trip circuit breaker CB1 and the start circuit would be disabled. If this condition occurred, local starting of the pump would not be effective because the fuel solenoid fails shut on loss of control voltage.

The fire compartments in which a fire may cause a loss of both fire pumps include:

- Fire Compartment BG-01 – This compartment is comprised of the Intake Valve Room and Tunnel. The Intake Valve Room contains safety-related cables. The cables are routed independently in solid bottom trays with a layer of ceramic fiber on the top. This compartment has a low combustible loading and the credited means of suppression is by use of portable extinguishers and fire hose stations and/or a yard hydrant.
- Fire Compartment DD-01 – This compartment consists of the CSR, which has automatic suppression. Small fires would be extinguished with portable

extinguishers and fire hoses. As discussed above, the cables are routed independently in solid bottom trays with a layer of ceramic fiber on the top. Any fire large enough to damage potentially both sets of cables would quickly result in sprinkler activation which would occur prior to damaging both of the cables. Once started, the electric pump would be shutdown locally and its operation would not be affected by the fire.

- Fire Compartment FF-01 – This compartment consists of the MCR, which is constantly occupied. There is no automatic suppression in the MCR. Small fires would be extinguished with wheeled or hand-held extinguishers or a fire hose from nearby stairwells.

Acceptance Criteria Evaluation:

Nuclear Safety and Radiological Release Performance Criteria:

A fire in Fire Compartment BG-01, DD-01, or FF-01 that renders the starting circuits for both fire pumps inoperable would not affect the ability to supply the required fire water during a fire since the fire pumps are not relied upon for nuclear safety functions. In the event of damage to both fire pumps' starting circuits, it would not affect the ability to perform an emergency start of the pump. The plant is also provided with alternate means of manual suppression via fire extinguishers to contain the fire while the electric fire pump is being manually locally started. In addition, offsite agencies are available to provide firefighting assistance and portable equipment is available to back charge the fire protection water supply system. Therefore there is no impact on the nuclear safety performance criteria.

The radiological release review was performed based on the manual fire suppression activities in areas containing or potentially containing radioactive materials and is not dependent on the location of the fire pumps. The location of the fire pumps does not change the radiological release evaluation performed that concluded that potentially contaminated water is contained and smoke is monitored. The location of the remote start circuit cables for the fire pumps do not add additional radiological materials to the area or challenge systems boundaries. Therefore, remote start circuit cables for the fire pumps currently in use at DBNPS has no impact on radiological release performance criteria.

Safety Margin and Defense-in-Depth:

The lack of rated fire barriers between the circuits for the electric fire pump and the diesel fire pump does not negate the ability to supply the required water during a fire. In the event that both sets of remote start cables are damaged and impair both fire pumps' starting circuits, it would not affect the ability to perform an emergency start of the pump. Therefore, the inherent safety margin and conservatisms in these analysis methods remain unchanged. The lack of fire rated separation between fire pump circuits does not result in compromising automatic fire suppression functions, manual fire suppression functions, or post-fire SSD capability. Therefore, the safety margin inherent in the analysis for the fire has been preserved.

The three echelons of DID are:

(1) To prevent fires from starting (combustible/hot work controls)

(2) Rapidly detect, control and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans)

(3) Provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable, success path remains free of fire damage, recovery actions)

Per NFPA 805 Section 1.2, DID is achieved when an adequate balance of each of these elements is provided. The location of the fire pumps and the associated starting circuits does not affect Echelons 1 and 2. Echelon 3 is maintained by adequate separation of the fire pumps to ensure one fire pump is operable if a fire affects another pump. In the event of damage to both fire pumps' starting circuits, it would not affect the ability to perform an emergency start of the pump. The location for the starting circuits does not result in compromising automatic fire suppression functions, manual fire suppression functions, or post-fire nuclear safety capability. Since a balance of the elements is provided, DID is achieved.

Conclusion:

NRC approval is requested for the lack of fire barrier separation between the remote start circuit cables running from the MCR to each respective fire pump as required by NFPA 805, Section 3.5.5. The present electrical circuit configuration meets NFPA 20-1974 and previous BTP 9.5-1 commitments. In the event that both sets of remote start cables are damaged and impair each corresponding pump's starting circuit, the electric fire pump can be locally manually started. Additionally, all compartments have other manual firefighting methods available.

Furthermore, the remote start circuits are routed through separate channels, and not routed through the same raceways. Where the circuits are routed in the same rooms, they are in solid bottom trays with a layer of ceramic fiber on top. In the event of a fire, damage to these remote start cables after a pump was started would not prevent the pump from continuing to run.

DBNPS determined that the performance-based approach satisfies the following criteria:

- Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release,
- Maintains safety margins, and
- Maintains fire protection DID (fire prevention fire detection, fire suppression, mitigation, and post-fire safe and stable capability).

Approval Request 5

NFPA 805 Section 3.5.14 states:

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.

DBNPS is requesting approval for curb box valves in the fire protection water supply that do not meet the NFPA 805, Section 3.5.14 requirements for electrical supervision, locking, or sealing. These valves are included in DB-FP-04031, "Quarterly Fire Valve Alignment Verification," and are allowed by NFPA 24, "Standard for Outside Protection - 1970."

Basis for Approval Request 5:

NFPA 805, Section 3.5.14 requires the valves to be electrically supervised, locked, or sealed. Several control valves in the supply lines to the individual fire hydrants and a portion of the south loop are underground valves and are not supervised as required. These valves do not have an extended permanently attached method of changing the valve's position. This type of valve was selected because the location of the underground piping in the yard precludes the installation of a post indicator valve above the surface level that would interfere with vehicle traffic, equipment movement, and have the potential for damage. These valves are referred to as curb box valves in DB-FP-04031.

The subject underground control valves are provided with a curb box for access and require the use of a long handle T-wrench to reposition the valve. These valves are periodically inspected per DB-FP-04031, to confirm that they are in the required open position.

The underground valves and/or curb boxes are not designed to accept monitoring switches, locks and chains, or sealing devices. The valves are not subject to inadvertent closure or tampering because they require the use of a special T-wrench to be operated.

Curb box valves are used to control the water supply to outdoor fire hydrants. Curb box valves also provide isolation to the south loop, which controls the water supply to a few hydrants, to the Containment Access Facility, and to the Personnel Shop Facility, per DB-FP-04031 and M-016A, "Station Fire Protection System." The valves are located underground, so they cannot be inadvertently operated or accidentally mis-positioned. The valves are included in a periodic inspection program that verifies that the valves are in the correct position. Even though the valves do not have a method to monitor tampering or repositioning as other type of valves, their inaccessibility and the physical requirement to obtain the special T-wrench prevents tampering. NFPA 805-2001 references NFPA 24-1995, which in Section 3.6.2 has an exception for non-supervised underground gate valves with roadway boxes (i.e. curb box valves). Therefore, due to their inaccessibility, supervision or valve locking is not required.

Acceptance Criteria Evaluation:

Nuclear Safety and Radiological Release Performance Criteria:

The non-supervision of curb valves for the underground yard fire main loop does not affect nuclear safety performance criteria (NSPC) since the valves are located underground and are not subject to inadvertent closure or tampering because of their inaccessibility and requirement to use a special T-wrench for operation. The valves are operated by trained personnel to ensure that water is available to plant fire protection systems as required; therefore, there is no impact on the NSPC. Periodic inspections ensure that the valves are in the correct position.

Similarly, the non-supervision of curb box valves has no impact on the radiological release performance criteria. The radiological review was performed based on the potential location of radiological concerns and is not dependent on the fire protection water system. The use of non-supervised curb box valves does not change the radiological release evaluation performed that concluded that potentially contaminated water is contained and smoke is monitored. The fire protection water system does not add additional radiological materials to the areas or challenge systems boundaries.

Safety Margin and Defense-in-Depth:

The non-supervised curb valves for the underground fire main loop require a special T-wrench for operation, and are operated by trained, authorized personnel. The curb valves are periodically inspected to ensure they are in the correct position. The code edition of NFPA 24 referenced in NFPA 805 and subsequent editions allows an exception not to lock or electrically supervise curb box valves. Therefore, the safety margin inherent in the analysis for the fire event has been preserved.

The three echelons of DID are:

(1) To prevent fires from starting (combustible/hot work controls).

(2) Rapidly detect, control and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans).

(3) Provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable, success path remains free of fire damage, recovery actions).

Per NFPA 805, Section 1.2, DID is achieved when an adequate balance of each of these elements is provided.

Echelon 1 is met through plant fire prevention procedures and is not affected by this configuration. Echelons 2 and 3 are met since the non-supervised valves do not adversely affect the system pressure or flow, nor compromise fire suppression functions, manual fire suppression functions, or post-fire safe shutdown capability. Since a balance of the elements is provided, DID is achieved.

Conclusion:

NRC approval is requested for unsupervised curb box valves as required by NFPA 805, Section 3.5.14. The underground valves and/or curb boxes are not designed to accept monitoring switches, locks and chains, or sealing devices. The valves are not subject to inadvertent closure or tampering because they require the use of a special T-wrench to be operated and are located below grade. The valves are located underground, so they cannot be inadvertently operated or accidentally mis-positioned. Therefore, even though the valves do not have the method to monitor tampering or repositioning as other type valves, their inaccessibility and the physical requirement to obtain the special T-wrench prevents tampering. NFPA 24 referenced in NFPA 805 allows an exception not to lock or electrically supervise curb box valves. The valves are included in the DBNPS inspection program, which periodically verifies that the valves are in the correct position. DBNPS determined that the performance-based approach satisfies the following criteria:

- Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release,
- Maintains safety margins, and
- Maintains fire protection DID (fire prevention fire detection, fire suppression, mitigation, and post-fire safe and stable capability).

Approval Request 6

NFPA 805 Section 3.6.3 states:

> *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.*

DBNPS is requesting approval for using adjustable fog nozzles at hose stations which are located outside the high voltage electrical switchgear rooms.

Basis for Approval Request 6:

The current nozzles allow trained fire brigade members to select the desired spray pattern manually in lieu of limiting the nozzle's capabilities to a fixed fog, giving the trained firefighter more control over the various types of fires that could potentially occur in the vicinity of these hose stations. Although Hose Station HR-51 is located in Turbine Building Room 326, it is the nearest hose station to Room 325 (High Voltage Switchgear Room A in Fire Compartment S-01), which is located in the Auxiliary Building. Similarly for Hose Station HCS-23, which is located in Room 321 of the Auxiliary Building, it is the nearest hose station to Room 323, High Voltage Switchgear Room B in Fire Compartment Q-01 (A-223F, "Fire Protection General Floor Plan El. 585'-0"" and C-FP-013.10-007, "Fire PRA Task 1 - Plant Boundary Definition and Partitioning"). Either of these hose stations may potentially be used in the event of a fire in one of the high voltage switchgear rooms. These hose stations can provide manual suppression capabilities for a multitude of areas and hazards within the Turbine Building and Auxiliary Building.

Fire brigade members are trained to use the appropriate spray pattern for different types of fires expected at DBNPS. In the event of an electrical fire, fire brigade members are trained on using the appropriate fog pattern. Administrative procedure DB-FP-00005, "Fire Brigade," refers to Fire Brigade training requirements in NT-OT-07007, "Fire Brigade Training." Administrative procedure NT-OT-07007 establishes the requirements for the training and qualification of DBNPS Fire Brigade members. Training includes both classroom and on-the-job practical training to ensure that the Fire Brigade members have the necessary knowledge, skills, and abilities to successfully fight fires at DBNPS. Fire Brigade Member Qualification Manual FBI-900, states in the Practical Requirements section, "Set-up and operate a combination fog nozzle." Nuclear Operating Business Practice DBBP-TRAN-0012, "Conduct of Live Fire Training," states that the primary objective of live fire training is "to train and evaluate the Fire Brigade in the use of recognized safe firefighting practices in extinguishment of Class A, B, C, and D type fires." Since the fire brigade members are experienced and trained to use the correct spray pattern, it is essential for the fire brigade members to have the appropriate tools to extinguish fires using practiced techniques. The adjustable fog nozzles allow the Fire Brigade to extinguish potential electrical fires in other areas. The nozzles currently in use at DBNPS allow the Fire Brigade to adapt manual suppression techniques quickly to potentially changing fire sources and scenarios. Limiting the nozzle capability to fixed fog will not enhance plant safety and could delay the Fire Brigade response time if the nozzle is required to be interchanged to match the source and scenario.

Acceptance Criteria Evaluation:

Nuclear Safety and Radiological Release Performance Criteria:

The use of adjustable nozzles in lieu of fixed fog nozzles at hose stations does not affect nuclear safety performance criteria. The fire brigade members are experienced and trained on using the nozzles. Hose stations can be used on multiple types of fires in the Turbine, Auxiliary Buildings, other locations, as well as the high voltage switchgear rooms. It is critical to maintain a nozzle that can quickly be adjusted to adapt to any expected fire source, as well as potentially changing fire scenarios.

The use of adjustable nozzles at hose stations has no impact on the radiological release performance criteria. The radiological review was performed based on the potential location of radiological concerns and is not dependent on the fire protection water system. The use of adjustable nozzles at hose stations does not change the radiological release evaluation performed that concluded that potentially contaminated water is contained and smoke is monitored. The use of adjustable nozzles at hose stations does not add additional radiological materials to the areas or challenge systems boundaries.

Safety Margin and Defense-in-Depth:

Fire brigade members are trained to use the appropriate spray pattern for different types of fires. It is also essential for the fire brigade members to have the appropriate tools to extinguish fires using practiced techniques. The nozzles currently in use allow the fire brigade to adapt manual suppression techniques to changing fire sources and scenarios. Limiting the nozzle capability to fixed fog will not enhance plant safety. Therefore, the safety margin inherent in the analysis for the fire event has been preserved.

The three echelons of DID are:

(1) To prevent fires from starting (combustible/hot work controls).

(2) Rapidly detect, control and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans).

(3) Provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable, success path remains free of fire damage, recovery actions).

Per NFPA 805, Section 1.2, DID is achieved when an adequate balance of each of these elements is provided.

Echelon 1 is met through fire brigade training procedures and is not affected by this configuration. Training includes both classroom and on-the-job practical training to ensure that the Fire Brigade members have the necessary knowledge, skills, and abilities to successfully fight fires. Echelon 2 is met since the use of adjustable nozzles in lieu of fixed fog nozzles at these hose stations will allow the fire brigade members to adapt the manual suppression capability to the appropriate fire scenarios. Echelon 3 is met since the use of adjustable nozzles do not adversely affect the system pressure or flow, nor compromise fire suppression functions, manual fire suppression functions, or post-fire safe shutdown capability. Since a balance of the elements is provided, DID is achieved.

Conclusion:

NRC approval is requested to approve the use of adjustable fog nozzles in lieu of fixed fog nozzles at hose stations. This is in compliance with NFPA 805, Section 3.6.3 regarding the proper type of hose nozzle for the fire hazard, but is not in compliance with the requirement for fixed fog nozzles where high-voltage shock hazards exist. Fire Brigade experience and training is relied upon to ensure the appropriate nozzle setting is used on each type of fire. The performance-based approach is acceptable based on the following:

- It is impractical to limit the nozzle capabilities to a fixed fog nozzle because of its versatile requirements.
- The nozzles in use have the capability for fog spray patterns and are able to extinguish electrical fires effectively.
- The fire brigade members are experienced and trained on the use of the appropriate spray pattern for each specific fire scenario.
- The intent of the NFPA 805, Section 3.6.3 requirement is met because the capability to provide the appropriate hose stream (i.e., fog pattern) can be provided at these hose stations due to the adjustable capabilities of the nozzle.

DBNPS determined that the performance-based approach satisfies the following criteria:

- Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release,
- Maintains safety margins, and
- Maintains fire protection DID (fire prevention fire detection, fire suppression, mitigation, and post-fire safe and stable capability).

Approval Request 7

NFPA 805 Section 3.9.4 states:

Diesel-driven fire pumps shall be protected by automatic sprinklers.

DBNPS is requesting approval for the lack of automatic sprinkler coverage over the diesel-driven fire pump.

Basis for Approval Request 7:

Although the diesel-driven fire pump is not protected by automatic sprinklers, the following characteristics of the diesel-driven fire pump (Fire Compartment BE-01, Room 51) exist and thus serve as a basis for acceptability of the configuration. The diesel-driven fire pump:

- Is located in a separate room and divided by a 3-hr rated fire wall from the electric fire pump (Fire Compartment BH-01, Room 15).
- Is separated from adjacent compartments by 3-hr rated fire walls (Fire Compartment BD-01, Room 50; Fire Compartment BF-01, Rooms 52 and 52A).
- Is protected by early warning smoke detection. Alarms are received in the Main Control Room (MCR), which is constantly attended.
- Additionally:
  - Manual suppression means are available by use of the following elements:
    - Protection by a manually isolated sprinkler system. The manual valve (FP215) is located in an adjacent room, which would not require the operator to enter the pump room prior to charging the supply pipe with water. The manual control valve is easily accessible and appropriately marked.
    - Portable fire extinguishers and local hose stations are available from adjacent fire compartments (Fire Compartment BD-01, Room 50; Fire Compartment BF-01, Room 52; Fire Compartment BG-01, Room 53).
    - Has a relatively low combustible loading in the room and combustibles in the area are controlled.
  - Plant pre-fire plans and associated training ensures that the fire brigade and operations personnel are adequately trained regarding manual actuation and response to a fire in this area.

Acceptance Criteria Evaluation:

Nuclear Safety and Radiological Release Performance Criteria:

The lack of automatic sprinklers to protect the diesel-driven fire pump does not affect nuclear safety. Both the diesel-driven and electric fire pump individually have the ability to supply the required fire water and the diesel engine-driven fire pump is not relied upon for other water requirements. Therefore there is no impact on the nuclear safety performance criteria.

The lack of automatic sprinklers to protect the diesel engine-driven fire pump has no impact on the radiological release performance criteria. The radiological release review was performed based on the manual fire suppression activities in areas containing or potentially containing radioactive materials and is not dependent on the location of the fire pumps. The radiological release evaluation concluded that potentially contaminated water is contained and smoke is monitored. The configuration of the diesel-driven fire pump room does not add additional radiological materials to the area or challenge systems boundaries.

Safety Margin and Defense-in-Depth:

The lack of automatic sprinklers to protect the diesel-driven fire pump does not affect the ability to supply the required fire water in a fire event. Only one fire pump is required for fires in safety-related areas. The use of the diesel-driven fire pump has been defined by the limitations of the analysis of the fire. Therefore, the safety margin inherent in the analysis for the fire has been preserved.

The three echelons of DID are:

(1) To prevent fires from starting (combustible/hot work controls).

(2) Rapidly detect, control and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans).

(3) Provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable, success path remains free of fire damage, recovery actions).

Per NFPA 805, Section 1.2, DID is achieved when an adequate balance of each of these elements is provided. The lack of automatic sprinklers to protect the diesel engine-driven fire pump does not affect administrative controls for preventing fires from starting; therefore, echelon 1 is not affected by this configuration.

The lack of automatic sprinklers to protect the diesel engine-driven fire pump does not impact the ability of the automatic suppression systems to perform their functions. A fire affecting the diesel-driven fire pump would not impact the ability to provide 100% of the required fire water demand for safety related areas due to the capabilities of the electric fire pump.

The lack of automatic sprinklers to protect the diesel engine-driven fire pump does not allow fire propagation through the barrier, and does not result in compromising automatic fire suppression functions, manual fire suppression functions, or post-fire SSD capability. Since a balance of the elements is provided, DID is achieved.

Conclusion:

Based on this review, the existing mitigating features provide an equivalent level of fire protection to the fire pump area. Early notification of fire is provided. Manual suppression means are available by use of sprinklers, which can be actuated without entry into the fire pump room, and/or by the use of other manual devices such as portable fire extinguishers and local hose stations.

DBNPS determined that the performance-based approach satisfies the following criteria:

- Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release,
- Maintains safety margins, and
- Maintains fire protection DID (fire prevention fire detection, fire suppression, mitigation, and post-fire safe and stable capability).

Approval Request 8

The NRC approved an exemption to 10 CFR 50, Appendix R, Section III.G.2, in letters to Toledo Edison dated November 23, 1982 (Log 1138) , and December 26, 2002 (Log 6041). The exemption was for Fire Compartment T-01 that does not comply with III.G.2 because the separation between the CCW pumps is less than 20 feet and 1-hour fire barriers have not been installed between the pumps.

The Exemption dated December 26, 2002, states in part*…*

> *"The CCW pump room at the DBNPS is "L-"shaped and approximately 67 feet long and 26 feet to 35 feet wide. The entire room is a separate fire area bounded by fire barriers having a three hour rating. The room contains the following SSD components: three CCW pumps, heat exchangers, a ventilation system and associated flow switches, temperature indicators, isolation valves, controllers, and cabling. Only one operational CCW pump is required for SSD. Each CCW pump contains two gallons of Class III lube oil and is shielded to protect against sprinkler water spray. Control and power cables are in conduits and the FHA report contains data that indicate a combustible loading of 1,375 btu/ft^2. Smoke detectors, a wet pipe sprinkler system, a manual hose station, and portable extinguishers are provided for fire detection and suppression. The three CCW pumps are located in the 35 foot-wide section of the room and are separated 11 feet on-center. This configuration does not meet the 20 foot separation required in Appendix R, Section III.G.2.b. The 1982 exemption was granted due to the active fire protection features provided and the following passive fire protection features:*
>
> 1. *In-situ combustible loading is significantly less than one hour fire duration.*
> 2. *Redundant fire pumps* [sic] *are horizontally separated, 22 feet on-center. A spare third pump is between the redundant pumps with only two gallons of Class III lube oil comprising the only significant intervening combustible.*
> 3. *Curb/dikes are provided around each pump to contain potential oil leakage.*
> 4. *One hour fire rated barriers are provided on cables and valves.*
>
> *Since the granting of the existing exemption, the licensee has re-evaluated the fire hazards and made modifications to eliminate the need for fire wrap on cabling and valves in the CCW room. DBNPS informed the NRC of these evaluations and modifications in a series of letters. On March 15, 1989, the licensee submitted a letter postulating the loss of CCW room ventilation due to a fire and the effect on the CCW pumps. From manufacturer's data, the licensee determined that the maximum room temperature the pumps could remain operational was 185^{o}F. The licensee concluded that since the sprinkler system operated at 165^{o}F, the sprinkler system would keep the pumps from reaching 185^{o}F, allowing the pumps to remain operational. Therefore, the licensee concluded the CCW room ventilation was not necessary for SSD and fire wrap on the associated cabling for the ventilation system was no longer necessary.*
>
> *On February 16, 1990, the licensee submitted a letter on new fire protection compliance approaches including a re-evaluation of the necessity for fire wrap on the CCW header valves. For SSD, these valves were originally credited with*

providing cooling for the makeup pumps and the immediate reestablishment of reactor coolant pump (RCP) seal cooling. The re-evaluation noted that the high pressure injection system will assure reactor coolant system injection inventory and reactivity control and RCP seal injection. The licensee reported the installation of new RCP seals that do not require immediate cooling, allowing time to manually line-up valves for RCP seal cooling. Therefore, the licensee concluded that the CCW header valves were not immediately required for SSD and fire wrap was no longer necessary.

During 1992, the licensee replaced service water (SW) valves on the CCW heat exchangers with fail-safe valves. The replacement valves use a single solenoid, and during a fire the valves fail in an open position allowing the SW flow through the CCW heat exchanger. The licensee concluded that fire wrap around these valves was no longer necessary.

On January 25, 1999, the licensee notified the NRC that circuit modifications had eliminated the need for fire wrap on the CCW pump control circuits. The licensee removed local controllers and low-flow and high temperature limit switches from the CCW pump control circuits. Automatic start of redundant pump and valve transfer logic remained and local control would be done from the switchgear. The licensee concluded that removal of these circuits eliminated a potential source of spurious trips of an operating CCW pump and therefore fire wrap on this circuitry was no longer required. The licensee supplied, as part of the current exemption request, a table that identified the cabling and valves in the CCW room that originally required fire wrap and the corresponding evaluation and/or modification that eliminated the need for the fire wrap.

The underlying purpose of Appendix R, Section III.G is to provide reasonable assurance that at least one means of achieving and maintaining SSD conditions will remain available during and after any postulated fire. Exemptions to the specific requirements of the rule can be granted when, among other things, circumstances exist such that the underlying purpose of the rule is achieved, notwithstanding specific rule requirements are not met.

The SSD requirements at DBNPS require at least one CCW pump to remain operational during and after a fire. The November 23, 1982, exemption allowed less than 20 foot separation and no fire barriers between the CCW pumps. This was based on the existence of adequate active and passive fire protection features that provided reasonable assurance that one CCW pump would remain operational. The active protection features were smoke detectors, a wet pipe sprinkler system, a manual hose station, and portable fire extinguishers. The passive fire protection features provided were: low in-situ combustible loading, minimal intervening combustibles, and curbing around the pumps to contain an oil spill fire, in addition to the fire wrap that is the subject of the current exemption request.

Active fire protection features have not changed since the granting of the existing exemption and combustible loading remains low. Under the re-evaluations discussed earlier protection of CCW header valves and ventilation circuits is not necessary in order for at least one CCW pump to remain operational during and *after a fire. Modifications have changed the SW valves to fail safe and removed circuits that would cause a spurious pump trip. In summary, DBNPS has demonstrated reasonable assurance of the availability of CCW during and after a postulated fire in the CCW pump room, notwithstanding less than 20 foot separation between the CCW pumps, the absence of fire barriers and no fire wrap on the SSD cables and valves in the CCW pump room. Therefore, under these circumstances, the underlying purpose of the regulation is still achieved.*

4.0 CONCLUSION

On the basis of the staff review and evaluation of the information provided in the licensee's request to amend the existing exemption, the staff concludes that the request for exemption from the technical requirements of Section III.G.2 of Appendix R to 10 CFR Part 50 demonstrates that under the proposed alternative circumstances from original circumstances that existed at the time the existing exemption was granted, the underlying purpose of the regulation is still achieved. Thus, the NRC staff has determined that there are special circumstances present, as specified in 10 CFR 50.12(a)(2)(ii), in that application of Section III.G.2. of 10 CFR Part 50, Appendix R is not necessary in order to achieve the underlying purpose of the regulation."

NFPA 805 Transition Review Results

During the transition to NFPA 805 each exemption to 10 CFR 50, Appendix R was evaluated to ensure the basis for the exemption remained valid. During the evaluation of Licensing Action 02 (LA-02), it was determined that the following exemption attributes require updating:

1. The original exemption stated that fixed combustibles for T-01 consisted of six gallons of lubricating oil. The evaluation determined that there is approximately two gallons of lubricating oil per CCW pump, and oil to operate ventilation dampers, with a total of nine gallons of oil in T-01.
   - Evaluation
     - i. The equipment and total quantity of lube oil in fire compartment T-01 has not changed since the initial exemption request. Due to a lack of intervening combustibles, a fire involving the damper actuators would not affect the CCW pumps.
     - ii. The small change of reported oil quantity for a room of this size (approximately 2036 ft^2) has a very low overall effect to the total fire severity of the room.
2. The lube oil properties used at the time of the exemption request indicated a flashpoint of 450°F and an ignition temperature of approximately 700°F could not be verified due to changes in the lubrication oil process. The current lubricating oil properties for Mobil Medium and Mobil Light indicates that the flashpoint is greater than 392°F. In addition, the current MSDS depicts "N/D"; therefore, the auto-ignition temperature is indeterminate.

- Evaluation
    i. The lower reported flashpoint temperature is of low significance. A review of the potential sources from NUREG-6850 Task 6 Analysis for fire ignition sources does not show any potential ignition sources within the fire compartment to generate the temperatures required to reach the flashpoint.
    ii. The CCW pump motor is the closest fixed ignition source and, due to the low energy of a motor fire, it is not likely for a motor fire to ignite oil with a flashpoint of greater than 392°F.

3. The exemption dated December 26, 2002, stated that the combustible loading for T-01 was 1,375 BTU/FT^2. The current calculations still indicate significantly low combustible loading for T-01; however, the calculation now includes the cable insulation contained within the steel conduit, some HVAC thermal insulation, and the abandoned Thermo-Lag insulation. The current quantity of combustible loading is approximately 10,000 BTU/FT^2.
    - Evaluation
        i. The new combustible loading value is acceptable because it is still well below the reported value of less than a 1-hour rated fire severity as originally described, and the automatic wet-pipe suppression remains installed, functional, and is transitioning to NFPA 805 as a credited system.
        ii. The additional combustibles contained within the fire compartment are distributed uniformly throughout the fire compartment, but not in a configuration to create intervening combustibles. Due to the small quantities, it is very unlikely for a fire within the compartment to involve all combustibles.
        iii. Combustible loading calculations determine the fuel duration contributions, estimating free oxygen and the total consumption of all available fuel sources. In actuality, not all the fuel is consumed due to oxygen limitations, limited surface area exposure, and fire suppression; therefore, the calculated fire severities for any given area are conservative.
4. DBPNS submitted a letter dated December 14, 2004, (Serial No. 3105) to the NRC notifying them of a change in fire compartment T-01 sprinkler head activation temperatures from 165°F to 212°F. This temperature was not acknowledged with an SER; therefore, it is included as a reported change in this request.
    - Evaluation
        i. Typically, fires produce a buoyant plume that rises to the ceiling where heated gases begin to accumulate. As the fire continues to burn, hot gases rise into a stratified layer, resulting in a continuing increase in its depth. In the meantime, the air below the hot gas layer remains at

ambient temperature. The CCW pump room has a ceiling height of approximately 17 feet. The top of the CCW pump motors are approximately 7 feet above the floor, with the motor ventilation air intakes at a slightly lower elevation. Therefore, the distance from the CCW pump motor air intakes to the room ceiling exceeds ten feet. Even though the sprinkler actuation temperature is now higher than the 185°F temperature limit for the CCW pump motor intake, the vertical distance between the sprinklers and the CCW pump motor intakes ensures that sprinkler actuation will still occur before the CCW pump motor intake temperature limit is exceeded. In no case will the temperature at the CCW motor air intakes exceed 185°F.

Based on the above evaluation of the changes since the exemption approvals, it has been demonstrated that the changes are insignificant and do not change the intent or margin of safety from the approved exemption request; therefore, approval of the current conditions is requested to transition LA-02 into the DBNPS NFPA 805 Licensing Basis.

Acceptance Criteria Evaluation:

Nuclear Safety and Radiological Release Performance Criteria:

NFPA 805 Section 4.2.3.3(c) requires a 1-hour fire barrier between redundant safe shutdown components, and fire detection and suppression in the area. The CCW pumps are located within the fire compartment T-01, which has credited detection and suppression. The absence of 1-hour fire barriers separating the CCW pumps has no impact on fire suppression activities, nor impact on radiological release performance criteria.

The radiological review was performed based upon the potential location of radiological concerns and is addressed by the fire brigade response procedures, training to minimize radiological release by ensuring that potentially contaminated water is contained, and that potential radiological smoke is monitored. Therefore, since one CCW Pump would be available in the event of a fire in this compartment, and any potential for radiological release is monitored, there is no impact on nuclear safety and radiological release performance criteria.

Safety Margin and Defense-in-Depth:

The CCW pumps located in compartment T-01 are sufficiently separated and there are enough defense-in-depth (DID) fire protection features in place to ensure that a fire initiating at any of the three CCW pumps has a low likelihood not to impact the remaining two. Therefore, the safety margin inherent in the analysis for the fire event has been preserved.

DID protects public health and safety from radioactive or hazardous material releases resulting from a fire event. Multiple independent and redundant echelons of DID offset potential human errors and mechanical failures so that no single echelon, no matter how robust, is exclusively relied upon. The three echelons of fire protection DID include the following:

1. To prevent fires from starting (combustible/hot work controls)

2. Rapidly detect, control and extinguish fires that do occur, thereby limiting damage (fire detection systems, automatic fire suppression, manual fire suppression and pre-fire plans);
3. Provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barriers, fire rated cable; success path remains free of fire damage and recovery actions).

Per NFPA 805, Section 1.2, DID is achieved when an adequate balance of each of these elements is provided.

At DBNPS, the subject CCW pumps contain very little lubrication oil in their unpressurized reservoirs and there are no credible ignition sources nearby. The cabling within this fire compartment is routed through Schedule 40 steel conduit. The site has administrative controls on transient combustibles and controls potential ignition sources; therefore, DID echelon 1 is preserved.

In the unlikely event of a fire, the fire would be promptly detected by the fire detection system. Once a fire detector is activated and the presence of a fire is confirmed, the pre-fire plans provide guidance for a well-trained fire brigade to respond promptly to the emergency. Furthermore, the automatic ‘wet-pipe’ sprinkler system would begin suppression activities at a temperature below which the hot gas layer temperature would affect the remaining CCW pumps. In addition, fire extinguishers and hose stations are located within and are readily accessible from nearby fire areas, preserving DID echelon 2.

DBNPS Schedule 40 steel conduit provides a robust fire barrier for circuit separation of redundant CCW trains to preserve one train free of fire damage, enabling safe shutdown of the plant. Limited fixed ignition sources make a significant fire unlikely to initiate in Fire Compartment T-01.

The existing distance separating the CCW pumps, lack of significant intervening combustibles, automatic suppression and detection, the fire brigade, and administrative controls provide a balance of elements that achieves DID and supports a margin of safety at DBNPS.

Conclusion:

NRC approval is requested for the lack of 1-hour fire rated barriers separating the three CCW pumps in fire compartment T-01 (Room 328) per NFPA 805, Section 4.2.3.3(c).

DBNPS determined that the performance-based approach satisfies the following criteria:

- Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release,
- Maintains safety margins, and
- Maintains fire protection defense-in-depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire safe and stable capability).

M. License Condition Changes

8 Pages Attached

The current Davis-Besse Nuclear Power Station, Unit 1, fire protection operating license (OL) condition 2.C(4) will be replaced with the standard operating license condition in Regulatory Position 3.1 of RG 1.205, Revision 1, "Risk-Informed, Performance-Based Fire Protection for Light-Water Nuclear Power Plants," Revision 1, as modified by FAQ 06-0008, Revision 9 (ML073380976).

It is FENOC's understanding that, implicit in the superseding of these license conditions, prior fire protection SERs and commitments have been superseded in their entirety by the revised license condition. However, Commission Order EA-02-026 (TAC No. MD4498) incorporated the mitigation strategies required by Section B.5.b. This order requires that strategies for addressing large fires and explosions be maintained for key areas. The elements of license condition 2.C(8), Davis-Besse Nuclear Power Station, Unit 1, NPF-3 will be coordinated with the station organizations responsible for these License Conditions in order to provide effective station integration relative to the DBNPS, NFPA 805 project implementation. This OL condition will remain in effect.

No other license conditions need to be superseded or revised. FENOC implemented the following process for determining that OL Condition 2.C(4) is the only license condition required to be superseded to implement the new fire protection program that meets the requirements of 10 CFR 50.48(a) and 50.48(c):

A review of the current DBNPS OL NPF-3, Amendment 286 was performed by using electronic searches of the FENOC FileNet System. The FENOC FileNet System contains DBNPS licensing documents, correspondence, regulatory, and guidance materials, including documents related to the operating license, the Technical Specifications, the fire protection program, the UFSAR and subsequent revisions, and correspondence to and from the NRC.

<u>Supersede the following Operating License Condition 2.C(4)</u>

2.C(4) <u>Fire Protection</u>

FENOC shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in the Updated Safety Analysis Report and as approved in the SERs dated July 26, 1979, and May 30, 1991, subject to the following provision:

FENOC 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.

<u>Replace with New License Condition:</u>

DOCKET NO. 50-346, DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1, RENEWED FACILITY OPERATING LICENSE, NPF-3, **2.C(4), page 6**

LICENSE CONDITION INSERT

FENOC shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment request dated __________ (and supplements dated __________) and as approved in the safety evaluation report dated __________ (and supplements dated __________). Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

<u>Risk-Informed Changes that May Be Made Without Prior NRC Approval</u>

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed fire PRA model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

(a) Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins.

The change may be implemented following completion of the plant change evaluation.

(b) Prior NRC review and approval is not required for individual changes that result in a risk increase less than 1E-7/year for CDF and less than 1E-8/year for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

<u>Other Changes that May Be Made Without Prior NRC Approval</u>

(1) Changes to NFPA 805, Chapter 3, Fundamental Fire Protection Program

Prior NRC review and approval are not required for changes to the NFPA 805, Chapter 3, fundamental fire protection program elements and design requirements for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is functionally equivalent or "adequate for the hazard." The licensee may use an engineering evaluation to demonstrate that a change to NFPA 805, Chapter 3, element is functionally equivalent to the corresponding technical requirement. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard.

The licensee may use an engineering evaluation to demonstrate that changes to certain NFPA 805, Chapter 3, elements are acceptable because the alternative is "adequate for the hazard." Prior NRC review and approval would not be required for alternatives to four specific sections of NFPA 805, Chapter 3, for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is "adequate for the hazard." A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement using a relevant technical requirement or standard. The four specific sections of NFPA 805, Chapter 3, are as follows:

- *"Fire Alarm and Detection Systems" (Section 3.8);*
- *"Automatic and Manual Water-Based Fire Suppression Systems" (Section 3.9);*
- *"Gaseous Fire Suppression Systems" (Section 3.10); and,*
- *"Passive Fire Protection Features" (Section 3.11).*

This license condition does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805.

(2) Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee's fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC safety evaluation report dated _____________ to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program.

Transition License Conditions

(1) Before achieving full compliance with 10 CFR 50.48(c), as specified by (2) below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in (2) above.

(2) The licensee shall implement the modifications described in the _______________ submittal of the (Davis-Besse) NFPA 805 Transition Report, Table S-1, "Plant Modifications Committed," to complete the transition to full compliance with 10 CFR 50.48(c) by _________________.

(3) The licensee shall maintain appropriate compensatory measures in place until completion of the modifications delineated above.

Proposed Operating License Changes (markup)

2.C(4) Fire Protection

~~FENOC shall implement and maintain in effect all provisions of the approved Fire Protection Program as described in the Updated Safety Analysis Report and as approved in the SERs dated July 26, 1979, and May 30, 1991, subject to the following provision:~~

~~FENOC 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~~.

(5) Deleted per Amendment No. 279.

(6) Antitrust Conditions

FENOC and FirstEnergy Nuclear Generation, LLC shall comply with the antitrust conditions delineated in Condition 2.E of this license as if named therein. FENOC shall not market or broker power or energy from the Davis-Besse Nuclear Power Station, Unit No. 1. FirstEnergy Nuclear Generation, LLC is responsible and accountable for the actions of FENOC to the extent that said actions affect the marketing or brokering of power or energy from the Davis-Besse Nuclear Power Station, Unit No. 1, and in any way, contravene the antitrust license conditions contained in the license.

Amendment No. ~~286~~

Revised Operating License Pages

OL INSERT

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2.C(4) Fire Protection

FENOC shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the license amendment request dated __________ (and supplements dated __________) and as approved in the safety evaluation report dated __________ (and supplements dated __________). Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

Risk-Informed Changes that May Be Made Without Prior NRC Approval

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed fire PRA model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

(a) Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

(b) Prior NRC review and approval is not required for individual changes that result in a risk increase less than 1E-7/year for CDF and less than 1E-8/year for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

Amendment No. __

Other Changes that May Be Made Without Prior NRC Approval

(1) Changes to NFPA 805, Chapter 3, Fundamental Fire Protection Program

Prior NRC review and approval are not required for changes to the NFPA 805, Chapter 3, fundamental fire protection program elements and design requirements for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is functionally equivalent or "adequate for the hazard." The licensee may use an engineering evaluation to demonstrate that a change to NFPA 805, Chapter 3, element is functionally equivalent to the corresponding technical requirement. A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement, using a relevant technical requirement or standard.

The licensee may use an engineering evaluation to demonstrate that changes to certain NFPA 805, Chapter 3, elements are acceptable because the alternative is "adequate for the hazard." Prior NRC review and approval would not be required for alternatives to four specific sections of NFPA 805, Chapter 3, for which an engineering evaluation demonstrates that the alternative to the Chapter 3 element is "adequate for the hazard." A qualified fire protection engineer shall perform the engineering evaluation and conclude that the change has not affected the functionality of the component, system, procedure, or physical arrangement using a relevant technical requirement or standard. The four specific sections of NFPA 805, Chapter 3, are as follows:

- "Fire Alarm and Detection Systems" (Section 3.8);
- "Automatic and Manual Water-Based Fire Suppression Systems" (Section 3.9);
- "Gaseous Fire Suppression Systems" (Section 3.10); and,
- "Passive Fire Protection Features" (Section 3.11).

This license condition does not apply to any demonstration of equivalency under Section 1.7 of NFPA 805.

(2) Fire Protection Program Changes that Have No More than Minimal Risk Impact

Prior NRC review and approval are not required for changes to the licensee's fire protection program that have been demonstrated to have no more than a minimal risk impact. The licensee may use its screening process as approved in the NRC safety evaluation report dated ______________ to determine that certain fire protection program changes meet the minimal criterion. The licensee shall ensure that fire protection defense-in-depth and safety margins are maintained when changes are made to the fire protection program.

Amendment No. __

Transition License Conditions

(1) Before achieving full compliance with 10 CFR 50.48(c), as specified by (2) below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in (2) above.

(2) The licensee shall implement the modifications described in the ________________ submittal of the (Davis-Besse) NFPA 805 Transition Report, Table S-1, "Plant Modifications Committed," to complete the transition to full compliance with 10 CFR 50.48(c) by __________________.

(3) The licensee shall maintain appropriate compensatory measures in place until completion of the modifications delineated above.

(5) Deleted per Amendment No. 279.

(6) Antitrust Conditions

FENOC and FirstEnergy Nuclear Generation, LLC shall comply with the antitrust conditions delineated in Condition 2.E of this license as if named therein. FENOC shall not market or broker power or energy from the Davis-Besse Nuclear Power Station, Unit No. 1. FirstEnergy Nuclear Generation, LLC is responsible and accountable for the actions of FENOC to the extent that said actions affect the marketing or brokering of power or energy from the Davis-Besse Nuclear Power Station, Unit No. 1, and in any way contravene the antitrust license conditions contained in the license.

Amendment No. __

N. Technical Specification Changes

3 Pages Attached

FENOC implemented the following process for determining which Technical Specifications (TS) were required to be either revised or superseded to implement the new fire protection program which meets the requirements in 10 CFR 50.48(a) and 10 CFR 50.48(c).

- A review of the DBNPS Plant Technical Specifications was performed using FENOC's FileNet System. The FENOC FileNet System contains DBNPS licensing documents, correspondence, regulatory, and guidance materials, including documents related to the operating license, the Technical Specifications, the fire protection program, the UFSAR and subsequent revisions, correspondence to and from the NRC.

FENOC determined that the following changes to the DBNPS Plant Technical Specifications are necessary for adoption of the new fire protection licensing basis:

- Existing TS paragraph 5.4.1.c to be revised as shown below:

  c. Quality assurance for effluent and environmental monitoring; and

  d. ~~Fire Protection Program implementation; and~~

  ~~e.~~ All programs specified in Specification 5.5.

Existing TS 5.4.1.d is being deleted and the subsequent paragraph is being renumbered because, after completion of the transition to NFPA 805, the requirement for establishing, implementing, and maintaining fire protection procedures will be contained in 10 CFR 50.48(a) and 10 CFR 50.48(c), as specifically outlined in Section 3.2.3, "Procedures," of NFPA 805.

Proposed Technical Specification Change (Mark-up)

5.0 ADMINISTRATIVE CONTROLS

5.4 Procedures

5.4.1 Written procedures shall be established, implemented, and maintained covering the following activities:

a. The applicable procedures recommended in Regulatory Guide1.33, Revision 2, Appendix A, February 1978;

b. The emergency operating procedures required to implement the requirements of NUREG-0737 and to NUREG-0737, Supplement 1, as stated in Generic Letter 82-33;

c. Quality assurance for effluent and environmental monitoring; ← **and**

d. ~~Fire Protection Program implementation; and~~

~~e.~~ All programs specified in Specification 5.5.

Revised Technical Specification Pages

5.0 ADMINISTRATIVE CONTROLS

5.4 Procedures

5.4.1 Written procedures shall be established, implemented, and maintained covering the following activities:

a. The applicable procedures recommended in Regulatory Guide1.33, Revision 2, Appendix A, February 1978;

b. The emergency operating procedures required to implement the requirements of NUREG-0737 and to NUREG-0737, Supplement 1, as stated in Generic Letter 82-33;

c. Quality assurance for effluent and environmental monitoring; and

d. All programs specified in Specification 5.5.

O. Orders and Exemptions

2 Pages Attached

Exemptions

Rescind the following exemptions granted against 10 CFR 50, Appendix R as follows for DBNPS:

- November 23, 1982: Control Room/Cabinet Room (FF-01, FF-02, and FF-03) - Lack of Fixed Fire Suppression System (III.G.3 criteria). (LA 01)
- August 20, 1984: Auxiliary Feedwater Pump Rooms (E-01 and F-01) - Lack of 3-Hour Fire Barrier (III.G.2 criteria). (LA 03)
- August 20, 1984 and January 30, 1998: RCP Oil Collection (D-01) - Lack of Oil Collection System Capable of Collecting Leakage Oil Fill System and Containing the Oil (III.O criteria). (LA 12)
- April 18, 1990: Fire Door Rating (A-04 and A-05) - Lack of 3-Hour Fire Barrier (III.G.2 criteria). (LA 04)
- April 18, 1990: ECCS Room Cooler Fans (AB-01) - Lack of Fixed Fire Suppression System (III.G.3 criteria). (LA 05)
- April 18, 1990: Containment Air Cooler Fans (D-01) - Lack of 20 Foot Separation (III.G.2 criteria). (LA 06)
- April 18, 1990: Auxiliary Building HVAC Rooms (EE-01) - Lack of Fixed Fire Suppression System (III.G.3 criteria). (LA 07)
- April 18, 1990: Manhole 3001 (MA-01) - Lack of 20 Foot Separation, Automatic Suppression System, and Detection (III.G.2 criteria). (LA 08)
- April 18, 1990: Alternate Shutdown (R-01) - Lack of Fixed Fire Suppression System (III.G.3 criteria). (LA 09)
- April 18, 1990: Emergency Lighting - Lack of 8-Hr Battery Powered Emergency Lighting Units (III.J criteria). (LA 10)
- April 18, 1990: Embedded Conduits - Lack of 3-Hour Fire Barrier (III.G.2 criteria). (LA 11)
- December 26, 2002: CCW Pump Room (T-01) - Lack of 20 Foot Separation and 1-Hour Fire Barrier (III.G.2 criteria). (LA 02)
- July 21, 2005: Control Room AC Equipment Room (HH-01) – Lack of Fixed Fire Suppression System and Automatic Detection (III.G.3 criteria). (LA 14)

Specific details regarding these exemptions are contained in Attachment K.

Orders

No Orders need to be superseded or revised. FENOC performed the following actions to make this determination:

The DBNPS docketed correspondence was reviewed by performing electronic searches of the docketed correspondence files in the FENOC FileNet. The FENOC FileNet contains licensing documents, correspondence, and regulatory and guidance materials, including those documents pertaining to the operating license, the Technical Specifications, the fire protection program, the UFSAR, and correspondence with the NRC.

A specific review was performed of the license amendment that incorporated the mitigation strategies required by Section B.5.b of Commission Order EA-02-026 (TAC No. MD4498) to ensure that any changes being made for compliance with 10 CFR 50.48(c) do not invalidate existing commitments applicable to the plant. The review of this order demonstrated that changes to the fire protection program will not affect measures required by B.5.b.

P. RI-PB Alternatives to NFPA 805 10 CFR 50.48(c)(4)

None.

Q. No Significant Hazards Evaluations

3 Pages Attached

A written evaluation of the significant hazards consideration of a proposed license amendment is required by 10 CFR 50.92, "Issuance of Amendment." FENOC has evaluated the proposed amendment and determined that it involves no significant hazards consideration. According to 10 CFR 50.92, a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not perform the following:

1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

3) Involve a significant reduction in a margin of safety.

To the extent that these criteria apply to compliance with the requirements in NFPA 805, it is concluded that the proposed amendment does not involve a significant hazards consideration for the following reasons:

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

Response: No

Operation of DBNPS 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 accidents (DBAs) at DBNPS. The proposed amendment does not affect accident initiators, nor does it alter design assumptions, conditions, or configurations of the facility that would increase the probability of accidents previously evaluated. Further, the changes to be made for fire hazard protection and mitigation do not adversely affect the ability of SSCs to perform their design functions for accident mitigation, nor do they affect the postulated initiators or assumed failure modes for accidents described and evaluated in the UFSAR. SSCs required to shut down the reactor safely and to maintain it in a safe and stable condition will remain capable of performing their design functions.

The purpose of the proposed amendment is to permit DBNPS to adopt a new fire protection licensing basis, which complies with the requirements of 10 CFR 50.48(a) and 10 CFR 50.48(c) and the guidance in RG 1.205, Revision 1. 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 10 CFR 50, Appendix R required fire protection features (69 Fed. Reg. 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 requirements of NFPA 805 have been satisfied.

NFPA 805, taken as a whole, provides an acceptable alternative for satisfying General Design Criterion 3 (GDC 3) of Appendix A to 10 CFR 50, meets the underlying intent of the NRC's existing fire protection regulations and guidance, and provides for DID. The goals, performance objectives, and performance criteria specified in Chapter 1 of the standard ensure that, if there are any increases in 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 the proposed amendment does not increase the probability of any accident previously evaluated. Equipment required to mitigate an accident remains capable of performing the assumed function(s). The proposed amendment will not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of any accident previously evaluated. The applicable radiological dose criteria will continue to be met. Therefore, the consequences of any accident previously evaluated are not significantly increased with the implementation of the proposed amendment.

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

Response: No

Operation of DBNPS in accordance with the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed change does not alter the requirements or functions for systems required during accident conditions. Implementation of the new fire protection licensing basis that complies with the requirements of 10 CFR 50.48(a) and 10 CFR 50.58(c) and the guidance in RG 1.205, Revision 1, will not result in new or different accidents.

The proposed amendment does not adversely affect accident initiators or 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 maintain the plant in a safe and stable condition remain capable of performing their design functions.

The proposed amendment does not introduce new or different accident initiators, nor does it 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 shutdown the reactor and maintain it in a safe and stable condition remain capable of performing their design functions.

The purpose of the proposed amendment is to permit DBNPS to adopt a new fire protection licensing basis that complies with the requirements of 10 CFR 50.48(a) and 10 CFR 50.48(c) and the guidance in Regulatory Guide 1.205, Revision 1. The NRC considers that NFPA 805 provides an acceptable methodology and appropriate performance criteria for licensees to identify fire protection systems and features that are an acceptable alternative to the 10 CFR 50, Appendix R required fire protection features (69 Fed. Reg. 33536, June 16, 2004).

The requirements of NFPA 805 address only fire protection and the impacts of fire on the plant that have previously been evaluated. Based on this, implementation of the proposed amendment would not create the possibility of a new or different kind of accident from any kind of accident previously evaluated. No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures will be introduced as a result of this amendment. There will be no adverse effect or challenges imposed on any safety-related system as a result of this amendment. 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 DBNPS 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 that 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 and stable condition remain capable of performing their design functions.

The purpose of the proposed amendment is to permit FENOC to adopt a new fire protection licensing basis which complies with the requirements in 10 CFR 50.48(a) and 10 CFR 50.48(c) and the guidance in RG 1.205, Revision 1. 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 10 CFR 50 Appendix R required fire protection features (69 Fed. Reg. 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 requirements of NFPA 805 do not result in a significant reduction in the margin of safety.

The proposed changes are evaluated to ensure that risk and safety margins are kept within acceptable limits. Therefore, the transition to NFPA 805 does not involve a significant reduction in the margin of safety.

The requirements of NFPA 805 are structured to implement the NRC’s mission to protect public health and safety, promote the common defense and security, and protect the environment. NFPA 805 is also consistent with the key principles for evaluating license basis changes, as described in RG 1.174, Revision 2, is consistent with the DID philosophy, and maintains sufficient safety margins.

Based on the evaluations noted in Items 1, 2, and 3 above FENOC has concluded that the proposed amendment presents no significant hazards consideration per the requirements set forth in 10 CFR 50.92(c), and, accordingly a finding of "no significant hazards consideration" is justified.

R. Environmental Considerations Evaluation

1 Page Attached

FENOC has evaluated the proposed amendment against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. FENOC has determined that the proposed amendment 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 the proposed amendment is to permit DBNPS to adopt a new fire protection licensing basis that complies with the requirements of 10 CFR 50.48(a) and 10 CFR 50.48(c) and the guidance in RG 1.205, Revision 1. The NRC considers that NFPA 805 provides an acceptable methodology and appropriate performance criteria for licensees to identify fire protection requirements that are an acceptable alternative to the 10 CFR 50, Appendix R required fire protection features (69 FR 33536, June 16, 2004).

The proposed amendment does not involve:

(1) A significant hazards consideration.

As stated in Section 5.3.1 and Attachment Q, the proposed amendment does not involve a significant hazards consideration.

(2) A significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

Compliance with NFPA 805 explicitly requires the attainment of performance criteria, objectives, and goals for radioactive releases to the environment. This radioactive release goal is to provide reasonable assurance that a fire will not result in a radiological release that affects the public, plant personnel, or the environment. The NFPA 805 transition based on fire suppression activities, but not involving fuel damage, has been evaluated and does not create any new source terms. Therefore, the proposed amendment will not change the types or amounts of any effluents that may be released offsite.

(3) A significant increase in the individual or cumulative occupational radiation exposure.

Compliance with NFPA 805 explicitly requires the attainment of performance criteria, objectives, and goals for occupational exposures. Therefore, the proposed amendment will not change the types or amounts of occupational exposures based on the results of the analysis performed and documented in Attachment E to this document based on firefighting activities.

Accordingly, the proposed amendment meets the eligibility criteria 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 is required to be developed in conjunction with the proposed amendment.

S. Modifications and Implementation Items

4 Pages Attached

Table S-1, Plant Modifications Committed, provided below, include a description of the modifications along with the following information:

- Risk ranking of the modification,
- A problem statement,
- A description of the proposed modification,
- An indication if the modification is currently included in the FPRA,
- A statement if compensatory measure is in place; and
- A risk-informed characterization of the modification and compensatory measure.
- The following legend should be used when reviewing the tables:
  - High = Modification would have an appreciable impact on reducing overall fire CDF.
  - Medium = Modification would have a measurable impact on reducing overall fire CDF.
  - Low = Modification would have either an insignificant or no impact on reducing overall fire CDF.

Table S-1 Plant Modifications Committed

Item	Rank	Problem Statement	Proposed Modification	In FPRA	Comp Measure	Risk Informed Characterization
DB-1421	H	Fire damage could result in loss of both steam driven auxiliary feedwater pumps. This could challenge the NSPC for decay heat removal.	ECP 13-0195 installs the emergency water storage tank and facility. This provides emergency power sources and makeup water. ECP 13-0196 installs the diesel-driven emergency feedwater pump and auxiliary equipment.	Yes	No	This modification provides an alternate source of feedwater by providing a diesel-driven power source and expanded emergency water storage.
DB-1983	H	FLEX RCS Charging Modification	ECP 13-0463 adds the FLEX RCS Makeup and Boration System. This includes the two FLEX RCS charging pumps that are credited in the fire PRA model.	Yes	No	This modification will help mitigate RCP seal LOCAs should seal cooling and seal injection or seal return be lost through the use of 2 FLEX RCS charging pumps.
DB-2010	H	Install Oil Containment Systems	Install oil containment systems for the unit sub transformers in compartments X-01 and Y-01.	Yes	No	The oil collection system is currently credited in the FPRA and is used to help prevent the creation of a hot gas layer in fire compartments X-01 and Y-01

Table S-2, Items provided below are those items (procedure changes, process updates, and training to affected plant personnel) that will be completed prior to the implementation of new NFPA 805 fire protection program. This will occur 180 days after NRC approval unless that date falls within a scheduled refueling outage. Then, implementation will occur 60 days after startup from that scheduled refueling outage.

Table S-2 Implementation Items

Item	Description	LAR Section/Source
DB-0341 DB-0538 DB-1074 DB-1093 DB-1095	Revise Pre-Fire Plans and Associated Training Modules to Include Action for Radioactive Release Scenarios; Review Pre-Fire Plans Against Safe Shutdown Analysis and Revise as Necessary; Revise Pre-Fire Plans to Include Rooms 330, 317A, 605, and 417A; Develop Pre-Fire Plan for Potential Radioactive Release Areas	Attachment E and Attachment A1, Sections 3.4.3(a), 3.4.2, and 3.4.2.1
DB-0463	Update DB-OP-02501 to Reference Ammeters for Runout Detection	Attachment C
DB-0492	Generate an Inspection Procedure for the Ceramic Fiber used in Trays	Attachment V
DB-0525 DB-1058	Revise DB-FP-00007 for Combustible and Transient Loading Program Requirements and to Include Duration Limits Based on Fire Modeling	Attachment A1, Sections 3.3.1.2 and 3.3.1.2(4)
DB-0541	Revise Fire Brigade Policies and Practices Based on the NFPA 600 Code Review	Attachment A1, Sections 3.4.1(a), 3.4.3(a), and 3.4.4
DB-0557	Revise Fire Brigade Drills to Include Areas Essential to Plant Operation, Safe Shutdown Areas, and to Control Radioactive Release	Attachment A1, Sections 3.4.3(b) and 3.4.3(c)
DB-0572	Revise Affected Procedures to Include Credited NFPA 805 Fire Protection Equipment	Attachment A1, Section 3.2.3(2)
DB-0573 DB-0600	Revise Performance-Based Inspection Requirements to Include NFPA 805 Credited Fire Protection Equipment	Attachment A1, Sections 3.11.1 and 3.2.3(1)
DB-0582	Assess Current Transformer Fire Effects Due to Open Secondary Circuits.	Attachment B, NEI Section 3.5.2.1
DB-0759	Revise Control Room Fire Alarm Response Procedure DB-OP-02529	Attachment A1, Section 3.4.1(d)
DB-1147 DB-1744 DB-1949	Develop a Monitoring Program as Required by NFPA 805	4.6.2, Attachment E, and Attachment V
DB-1591	Revise Documents to Include Fire Protection Water System Connections	Attachment A1, Section 3.5.16
DB-1603	Review of MOVs for Crediting CPT	Attachment V

Table S-2 Implementation Items

Item	Description	LAR Section/Source
DB-1695	Revise PRA for Plant Modifications	Attachment V
DB-1696 DB-2013 DB-2014	Update the Ignition Frequency Calculation and Fire Modeling for the following: Implementation of the DAFW System and FLEX, Add the Satellite phone Equipment That Will be Added to the EFWF and MCR per ECP-14-0465; Evaluate for Impacts on the Implementation of NFPA 805E for CP 14-0646 that Adds New Sound Powered Phone Equipment	Attachment V
DB-1810	Revise Interior Finish Procurement Specifications to Include Radiant Heat Flux	Attachment A1, Section 3.3.3
DB-1812	Revise Procedures to Trip RCPs During a Serious Fire Event	Attachment C
DB-1825	Revise DBNPS EEEEs	4.2.2, Attachment Z
DB-1878	Verification of Fire Damper Rating	Attachment A2, Fire Compartment II-04
DB-1908	Revise Procedures and Conduct Training to Implement NPO Requirements for NFPA 805	Attachment D
DB-1915	Revise Pre-Fire Plans and Training Materials to Address Radioactive Release	Attachment E
DB-1941	Revise Procedures Including Fire Brigade Training and Drills to Incorporate Recovery Actions	Attachment G
DB-1943	Review and Revise Fire PRA Human Reliability Analysis Upon Completion of Procedure Updates, Modifications, and Training	Attachment G
DB-1964	Revise Cable Specifications	Attachment A1, Section 3.3.3
DB-1988	Update SAFE to Document ECP 13-0406 Fuse Protection for DB Ammeters	Attachment C
DB-2005	Perform NFPA 58 Code Review of the Permanent Propane Tanks Installation	Attachment A1, Section 3.3.7.1
DB-2015	Revise the Level 1 Failure Reports to Reflect Where Normal Control Power is Available	Attachment C and Attachment V
DB-2020	Resolve the Non-enclosed Power Wiring for the Emergency Backup Lighting in Fire Compartment CC-01	Attachment A1, Section 3.3.5.1
DB-2029	Create Analysis Assessment to create the Data Set and Testing Criteria due to Modification of EFW and FLEX	Attachment V
DB-2031	Update documentation due to addition of power converters for the Auxiliary Feedwater and Motor Driven Feedwater target rock valves	Attachment C and Attachment V
DB-2035 DB-2036	Update documentation such as SAFE for Containment Spray Modifications and Instrumentation	Attachment C

Table S-2 Implementation Items

Item	Description	LAR Section/Source
DB-2037	Develop Fire Modeling Qualification Guides and Procedures	Attachment V

T. Clarification of Prior NRC Approvals

1 Page

No Clarifications Required.

U. Internal Events PRA Quality

62 Pages Attached

U.1 Overview

The technical acceptability of the DBNPS PRA model has been demonstrated by the peer review process. The purpose of the industry PRA peer review process is to provide a method for establishing the technical capability and adequacy of a PRA relative to expectations of knowledgeable practitioners, using a set of guidance that establishes a set of minimum requirements. PRA peer reviews continue to be performed as PRAs are updated (and upgraded) to ensure the ability to support risk-informed applications and has proven to be a valuable process for establishing technical adequacy of nuclear power plant PRAs (NEI-05-04).

The following summarize peer reviews of the DBNPS PRA.

April 7-11, 2008, DBNPS PRA Gap Assessment (Scientech)

The purpose of the gap assessment was to compare the current status of the PRA with the Supporting Requirements of the ASME PRA Standard Addendum “b” (ASME RA-Sb-2005), as amplified by RG 1.200, Revision 1. The peer review team, composed of PRA analysts, each experienced in PRA, provided an objective review of the PRA technical elements and a subjective assessment, based on their PRA experience, regarding the acceptability of the PRA elements.

The detailed results of the gap assessment are contained in Table U-1. The table identifies Supporting Requirements (SR) that did not meet Capability Category (CC) II of the PRA standard, those that only met CC I, and observations for improving the analysis and documentation (i.e., classified as No gap). The table includes the significance of the gap (i.e., from A, Significant to D, documentation only). Because the ASME PRA standard has been updated since this gap assessment, the first column also includes a reference to the current ASME PRA Supporting Requirement (ASME/ANS PRA Standard RA-S-2009). The last columns describe how the gap was closed in the internal events PRA-DB1-AL-R05 model, and in the Fire PRA model.

The scope of this gap assessment covered Internal Events and LERF; it did not include Internal Flooding. However, as discussed in item 2 below, because the Level 2 was updated after this review and included a subsequent peer review, Table U-1 does not include the gaps identified on this superseded Level 2 model.

October 17-18, 2011, Focused Peer Review of the DBNPS LERF PRA (Westinghouse)

Following an update of the DBNPS Level 2 PRA, a focused peer review was conducted. Primary reasons for updating the DBNPS Level 2 model included the following: resolving gaps; using current industry data sources; ensuring the model reflects the current plant configuration and practices; and updating the analysis and documentation to meet the current ASME PRA standard. While the focus of the peer review was primarily limited to the portions of the model associated with calculation of LERF, limited Level 2 (non-LERF) suggestions were included where appropriate.

The review covered 41 Supporting Requirements for LE. Nine (9) Facts and Observations (F&Os) were prepared, including one SR judged to be met at the CC-I level (LE-C1), and one SR judged to be not met (LE-C13). The detailed results of the peer review are contained in Table U-2. For each Supporting Requirement with an F&O, the F&O is characterized as a Finding, Suggestion, or not met. The last columns document how the F&O was closed in the internal events PRA-DB1-AL-R05 model, and in the Fire PRA model.

July 18- 20, 2012, Focused Peer Review of the DBNPS IFPRA (Westinghouse)

Following an update of the DBNPS Internal Flooding PRA (IFPRA), a focused peer review was conducted. Primary reasons for updating the DBNPS IFPRA included: utilizing insights from the Electric Power Research Institute (EPRI) final report on "Guidelines for Performance of Internal Flooding Probabilistic Risk Assessment"; utilizing current industry data sources; ensuring the model reflects current plant configuration and practices; and updating the analysis and documentation to meet the current ASME PRA standards.

The review covered 62 supporting requirements associated with IFPRA. Seventeen (17) F&Os were prepared, including eleven (11) findings (with two SRs not meeting CCII), five (5) suggestions, and one (1) superior (i.e., best practice). In addition, seven (7) SRs were determined to be not applicable to the DBNPS Internal Flood PRA. The detailed results of the peer review are contained in Table U-3. For each Supporting Requirement with an F&O, the F&O is characterized as a Finding or Suggestion (and one Superior), and whether or not the SR is met. The last columns document how the F&O was closed in the internal events PRA-DB1-AL-R05 model, and in the Fire PRA model.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
IE-A2 (IE-A2)	SR Not Met C	This SR is deemed to be met, except that RV rupture (excessive LOCA) was removed from the DBNPS PRA. This event, which cannot be mitigated, should be added back in to the DBNPS PRA. This likely entails simply the addition of a single basic event, RV rupture, which leads directly to core damage.	Revise IE Notebook, Volume 1 (Summary) to reflect that this LOCA event is included in the DBNPS PRA model, and add the basic event into the PRA logic model.	Reactor vessel rupture (Av) has been added to the model/analysis. The sequence is CD_AV. It is discussed in the Initiating Event and Sequence Analysis notebooks.	The RV rupture initiating event is N/A to the Fire PRA. In addition, as noted in Table 2-1 of NUREG/CR-6850, fire cannot induce vessel rupture.
IE-A5 (IE-A4)	SR Not Met C	The documentation states that a system-by-system review was performed; however, no documentation of a system-by-system review was found. A structured approach (i.e., FMEAs) to determine support system initiators was found in the document reviewed.	Prepare a spreadsheet, and include in the IE Notebook, Volume 1, the system-by-system review in search of initiating events.	As discussed in the Initiating Event notebook V1, a thorough review of each system at DBNPS was made to identify events that could be of a unique nature or that would not be well characterized by analyses or operating experience for other plants for potential Initiating Events. In addition, each system notebook includes a section that lists Initiating Events.	The Fire PRA Component Selection notebook discusses fire initiating events. Subtask 1 develops the list of initiating events/consequential events considered in the Fire PRA. Attachment B lists initiators and identifies if they could be fire-induced. Attachment C identifies systems and considers if they could cause a fire initiating event. Attachment E identifies fire initiating events associated with spurious operation of components.

Table U-1 Internal Events PRA Facts and Observations					
SR2009 (2005)[1]	**Gap[2]**	**Assessment Comments**	**Resolution To Meet CCII**	**Resolution/How Gap Closed in PRA-DB1-AL-R05**	**Resolution/How Gap Closed in Fire PRA**
IE-A6 (IE-A4a)	SR Not Met C	While the FMEAs in the notebook appear to be adequate, it is not clear, from the Notebook discussion, that common cause failures and/or routine system alignments were specifically considered.	Enhance the FMEAs in the IE Notebook, Volume 1 to specifically address common cause failures and system alignments.	In the systematic review of potential initiating events, random and common cause failures were considered, as well as routine system alignments (e.g., DBNPS includes common cause SW IEs for 3 different alignments). In addition, operating experience at DBNPS was examined to determine if additional events were applicable.	All system alignments considered in the IE model were also considered in the Fire model.
IE-A7 (IE-A5)	SR Not Met C	Not clear that that non-power DBNPS events were factored into the initiating events identification effort.	Evaluate DBNPS events that have occurred during non-power conditions to determine if any additional initiating events are identified. (It is unlikely that any additional events would be identified.)	As discussed in the Initiating Event notebook, events resulting in LERs that occurred during shutdown conditions were reviewed for potential at-power Initiating Events.	As discussed in the Initiating Event V1 notebook, events resulting in LERs that occurred during shutdown conditions were reviewed for potential Initiating Events; this included fires. Also, as described in C-FP-013-008, “Fire Ignition Frequencies,” DBNPS fire event data was collected and reviewed in support of the Fire PRA.
IE-A8 (IE-A6)	SR Met: (CC I) C	It is understood that some of the developers of the DBNPS PRA had Operations background; thus, Operations input into the list of initiators was inherently provided for. However, no documentation of this fact, or any interviews, was observed.	Interview Operations personnel to get their feedback/concurrence on the list of DBNPS PRA initiating events.	As discussed in the System Modeling Guidelines notebook, discussions were held with plant personnel to identify potential initiating events. A full day, system by system review was held with System Engineering Supervisors that included a review of potential initiators.	Operations input into the list of Initiators is N/A to the Fire PRA. However, the NFPA 805 team included previously licensed DBNPS SROs.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
IE-A9 (IE-A7)	SR Met: (CC I) C	Not clear from the documentation reviewed that DBNPS precursors were considered.	Review DBNPS precursors to search for any additional initiating events.	As discussed in the Initiating Event notebook, a review was made of events that have been identified as potential precursors. Additionally, DBNPS operating experience is included in the precursor reports (Initiating Event notebook ref. 21-27).	Documentation of DBNPS precursors is N/A to the Fire PRA: However, as discussed in response to Fire Peer Review F&O ES-A1-01, the Fire PRA Component Selection notebook, equipment failures were reviewed for possible initiators, and automatic and manual trips were reviewed for equipment failures caused by an initiating fire, including spurious operation.
IE-C6 (IE-C4)	SR Not Met B	Supporting requirement states to explicitly NOT exclude/screen reactor pressure vessel rupture as an initiating event. The current PRA model excludes reactor pressure vessel rupture as an initiating event.	None provided.	See IE-A2	See IE-A2
IE-C8 (IE-C6)	SR Not Met A	A draft guidance document has been developed by EPRI on the topic of support systems initiators. The depth of modeling should be performed as indicated in this guidance. Common cause modeling for IEs is still being discussed and there should be some additional guidance soon from EPRI. The SW model does not include any power to the pumps and should be modeled down to the interface with another SSIE.	Model support system initiators down to a level indicated in the SSIE modeling guidance. This will require expanding the SSIE models to include more failure events at the level of the pumps and lower.	The CCW and SW trees have been restructured to comply with EPRI support system initiating event modeling guidance. Other support system initiating events have also reviewed to ensure compliance. Necessary fault tree modifications were made and the documentation has been updated. Support system initiating events models are included in the system notebooks.	Modeling of support system initiators is N/A to the Fire PRA. However, as discussed in response to Fire Peer Review F&O ES-A2-01, system dependencies were reviewed to identify additional fire-induced failures (including spurious actuation) that could adversely affect equipment.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
IE-C10 (IE-C8)	SR Not Met B	The initiator quantification approach is to change the running failures to a full year long "mission time" and is similar to the approach suggested in the EPRI guidance.)	None provided.	The Initiating Events quantified using system models follow the current EPRI guidelines and use all relevant combinations of events involving the annual frequency of one component failure, with the conditional failure of their components. Support system initiating event models are included in the system notebooks.	Support system IE mission time is N/A to the Fire PRA.
IE-C12 (IE-C10)	SR Not Met D	No comparison of the Davis Besse IE values to other plants or generic data was performed.	Generate a table comparing the DBNPS initiator freq. to other similar plants and generic data. Provide a desc. of the results of the comparison and an explanation of any initiator freq. that are not similar to other plants or generic data.	As documented in the Initiating Event notebook, a comparison of DBNPS initiating events and frequencies was made against ANO, TMI, and generic data.	Comparing IE values to other plant is N/A to the Fire PRA. However, similar to other NFPA 805 plants, DBNPS used EPRI and NUREG CR/6850 data for fire ignition frequencies.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
IE-D1 (IE-D1)	SR Not Met D	A number of documentation issues were identified relative to initiating events. They are listed below, and need to be corrected. Given these identified issues, this SR is deemed not met. IE-D1/D2 Documentation Issues: - Volume 3 transient data has the last transient listed as 8/2004. Suggest adding a note giving the dates of the extended shutdown to clarify to the reviewers why no data since then. - IE Vol 1 section 2.2 states that all initiating event fault trees are included in Volume 4. Only the ISLOCA trees are included in Volume 4. There is a small amount of initiating event fault tree information in the system notebooks, but no detailed description of the initiating event fault trees could be found. - IE Vol 1 makes no mention in the text of where LOOP frequency is calculated. - IE Volume 2 tabs are mislabeled in the hardcopy notebook. - IE Vol 3 calculation of critical hours is very confusing. There are multiple periods calculated and no explanation provided as to why the different time periods are calculated or where the different time periods are to be used. - IE Vol 3 calculation of critical hours for the period 6/9/85-8/1/2006 shows calculation of time periods 12/31/85-8/1/2006. There is no explanation provided for excluding 6/9/85-12/31/85.	Correct above-identified issues and any other issues that may be identified by FENOC, in the IE documentation.	Initiating Event notebook V2 includes updated transient history, including a 9/6/2006 manual trip. (There were no transients between 8/2004 to 8/2006). Initiating Event notebook V1 discusses all initiating events; it discusses that V2 includes data for plant-specific initiating event frequencies and V3 includes ISLOCA initiating event frequencies. Section 1 includes detailed discussions of support system initiating events, including detailed changes to the system models to estimate the frequency. The system fault trees are included in the system notebooks. Initiating Event notebook V1 discusses that the LOOP frequency is based on generic data and documented in the LOOP notebook. All Initiating Event notebooks have been updated to correct editorial mislabeling. The critical hour calculation has been simplified and moved to IE notebook V1. The number of plant trips and LOFW events has been reconciled. The ISLOCA initiators, model and documentation have also been reconciled. IE Notebook V2 includes a note discussing events FMFWTRIP, FCONDTRP, FCIRCTRP; system faults in the applicable systems following a reactor/turbine trip.	Documentation gaps associated with internal event IEs are N/A to the Fire.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
IE-D1 (cont.)		- IE Vol. 1 Section 2.2 text for number of plant trips and loss of feedwater events since 6/1985 does not agree with the numbers shown in Volume 3. It appears the values in Vol 3 are correct and were used in the plant specific analysis. - IE Vol 4 revision summary states that ISLOCA initiator VS was deleted from the model and no longer considered credible. This matches the model and Table 5 of Volume 1. However the text of Volume 1 and Table 2 still state that VS is included in the model. IE-VS is still in the model database. - IE Vol 3 includes plant specific calculation for events FMFWTRIP, FCONDTRIP, FCIRCTRIP events. There is no discussion of these events or where/how they are used in the model. Also, these events are calculated using 48 demands. There is no explanation of where the 48 demands come from. The requirements of IE-C3 appear to be met, but the documentation does not explain how this was done.			

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
IE-D3 (IE-D3)	SR Not Met D	Assumptions and sources of uncertainty are not documented sufficiently to meet this SR.	Document IE assumptions and sources of uncertainty in accordance with NUREG-1855.	Each notebook includes a section on assumptions. Initiating Event notebook V1 includes initiating event assumptions. The Quantification notebook (and Level 2 notebook) include a compilation of the key sources of model uncertainties.	Each Fire PRA notebook includes a section on assumptions. Also, as discussed in Fire PRA SR UNC-A1-01, the Fire Uncertainty and Sensitivity Notebook contains a comprehensive list of assumptions, meaningful sensitivities, and distributions for both CDF and LERF, and should be used as a template.
AS-A3 (AS-A3)	SR Not Met D	See SC-A4.	None provided.	Appendix C has been added to Sequence Analysis notebook to show the impact of initiating events on all accident sequences.	IE resolution applies to the Fire PRA; the Fire PRA uses the Transient Event Tree.
AS-A4 (AS-A4)	SR Not Met C	The necessary operator actions to meet the critical safety functions for each initiator is not clear in the Sequence Analysis notebook.	Suggest that the success criteria tables in the Sequence Analysis notebook delineate all required operator actions.	Success Criteria tables have been added to the Sequence Analysis notebook and identify critical operator actions.	IE resolution applies to Fire PRA; the Fire PRA uses the Transient Event Tree and associated Success Criteria tables.
AS-A5 (AS-A5)	SR Not Met D	The accident sequence text does not draw significantly on the plant EOPs. They are referenced in the Reference section of the notebook; however, one would expect to see a greater tie in the accident sequence discussion to the EOPs.	Enhance Accident Sequence text to cite relevant EOP. Refer to AS-A10	In the Sequence Analysis notebook, a column has been added to each Success Criteria table to identify critical operator actions along with the associated EOP section.	IE resolution applies to Fire PRA; the Fire PRA uses the Transient Event Tree and associated Success Criteria tables with EOP references.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
AS-A10 (AS-A10)	SR Met: (CC I) C	Only one transient event tree has been constructed, and top logic was built to quantify all of the modeled transients (e.g., Reactor Trip versus Feedline Break versus Loss of C , etc.). While this approach, if implemented correctly, should produce accurate results, it does not provided sufficient accident sequence detail to demonstrate that differing mitigating systems responses, due to different transient initiators, are captured. It is also not readily scrutable by reviewers, or straightforward for non- or new PRA personnel to understand.	Develop an event tree for each transient initiator modeled in the PRA. Estimate effort required in included in AS-B1. Perform logic review to determine the fire event tree structure is OK.	See AS-A3	See AS-A3
AS-A11 (AS-A11)	SR Not Met C	All transfers between event trees should be clearly defined and accounted for. The manner in which the event tree transfers were treated is not totally clear from the document reviewed. For example, for sequences in which Reactor Trip fails following a Medium or Small LOCA, the event tree states "NOT DEVELOPED." For Medium LOCA, event K should not be included in the ET, as Reactor Trip is not required. For Small LOCA, on the other hand, Reactor Trip is required, but presumably is not accounted for in the DBNPS PRA, due to its low frequency.	Recommend table be created to account for all event tree transfer sequences, inc their disposition. Although transfers could be omitted from quant, based on very low freq, recommended all transfer sequences be included in the quant, even if they're so low that CCDP assumed to be 1.0. worthwhile for applications..	The Event Trees have been updated. Only the Transient event tree includes a transfer - to the ATWS event tree. Additional text has been added to the Sequence Analysis notebook and event trees to clearly define the transfer. Event K has been added to the SLOCA ET and identified as sequence SK. Event K has been added to the SGTR ET and identified as sequence RK. Event K has been deleted from the MLOCA ET; similar to the LLOCA, voiding in the core provides sufficient negative reactivity feedback to achieve initial shutdown and injection of borated water sources ensures control of reactivity.	IE Transient Event Tree resolution applies to Fire PRA; the Fire PRA uses the Transient Event Tree, which includes a transfer to the ATWS event tree.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
AS-B1 AS-B1)	SR Not Met C	Only one transient event tree has been constructed, and top logic was built to quantify all of the modeled transients (e.g., Reactor Trip versus Feedline Break versus Loss of C , etc.). While this approach, if implemented correctly, should produce accurate results, it does not provided sufficient accident sequence detail to demonstrate that differing mitigating systems responses, due to different transient initiators, are captured. It is also not readily scrutable by reviewers, or straightforward for non- or new PRA personnel to understand.	Develop an event tree for each transient initiator modeled in the PRA.	See AS-A3	See AS-A3
AS-C1 (AS-C1)	SR Not Met D	Use of a single transient event tree, with supporting top logic, should produce accurate results, but does not lend itself to/facilitate certain applications or peer review.	Develop an event tree for each transient initiator.	See AS-A3	See AS-A3
AS-C2 (AS-C2)	SR Not Met D	The following AS-C2 sub-items are deemed not to be met: (a), (c), (d) and (f).	Create event trees for all modeled transients and enhance documentation.	See AS-A3. Appendix C has been added to the Sequence Analysis notebook to identify IE impact on success criteria system tops. The Sequence Analysis notebook also includes success criteria tables that identify operator actions.	See AS-A3 and AS-A4

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
AS-C3 (AS-C3)	SR Not Met D	Assumptions and sources of uncertainty are not documented for the accident sequence analysis.	Document assumptions and sources of uncertainty pertaining to the accident sequence analysis.	Each PRA notebook includes a section on assumptions. Section 2 in the Sequence Analysis notebook identifies assumptions. The Quantification notebook (and Level 2 notebook) includes a compilation of key sources of model uncertainties.	Section 3 of the Fire PRA Model notebook identifies Fire PRA model assumptions. Also, as discussed in Fire PRA SR UNC-A1-01, the Fire Uncertainty and Sensitivity Notebook contains a comprehensive list of assumptions, meaningful sensitivities, and distributions for both CDF and LERF, and should be used as a template.
SC-A1 (SC-A1)	SR Not Met D	New MAAP calculations specify acceptance criteria of maximum hottest core node temperature of 1800F referenced to EPRI PSA Applications Guide. Use of this criteria is obviously a surrogate for the official definition of core damage, as provided in Section 2 of the Standard. However, a definition is not actually contained in the documentation.	Document the definition.	The definition of core damage has been added to Sequence Analysis notebook (see Section 3).	IE resolution applies to the Fire PRA; the Fire PRA uses the same definition.
SC-A2 (SC-A2)	SR Not Met D	Several new MAAP calculations, and new draft calculations, specify acceptance criteria of maximum hottest core node temperature of 1800F referenced to EPRI PSA Applications Guide. Use of this criteria in future calculations, perhaps referenced to this SR as well, ensures meeting this Supporting Requirement. However, not all success criteria are supported by new MAAP calculations and thus the acceptance criteria.	None provided.	MAAP calculations have been performed to support success criteria; this is discussed in the Sequence Analysis notebook, and the PRA Analysis Assessment is referenced. Also, Appendix A of the Sequence Analysis notebook summarizes the results.	IE resolution applies to the Fire PRA. In addition, the Fire PRA Model notebook discusses changes to the Transient Event tree to include DAFW and FLEX, including associated success criteria and MAAP runs (see Section 6 and attachment B).

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SC-A3 (SC-A4)	SR Not Met C	For Large and Medium LOCAs, Ref. 2 is cited but has been deleted. Specific deviations from FSAR acceptance criteria should be identified and referenced. It was not clear in the documentation which criterion was supported by the deleted Ref. 2. Deletion of Reference 2 results in an unverified success criteria assumption of 1-of-2 CFTs. Also, documentation states "It was judged that the likelihood of failure to accomplish such long-term actions was negligible." This judgment is in fact an assumption that should be called out as an assumption. In addition, bases should be provided for this assumption. Search for "assumption", "judgment", etc.	Develop basis for assumptions and provide the source.	The Sequence Analysis notebook includes a section on Assumptions. The Sequence tables also include a Basis column to support the success criteria (including USAR and MAAP references). The CFT LOCA success criteria has been updated to be consistent with the FSAR; a LLOCA requires 2 of 2 CFTs and a MLOCA requires 1 of 2 CFTS. The model and associated notebook changes have been made.	Large and Medium LOCAs are N/A to the Fire PRA; the Fire PRA uses the Transient Event Tree and associated Sequence tables.
SC-A5 (SC-A5)	SR Not Met D	Although it appears that a 24-hour mission time has been used, it is not documented. Other mission times (e.g., SBO mission times for EDGs, batteries, etc.) are included in system (fault tree) notebooks. Add any necessary human actions needed to properly model EDG recovery.	Document the mission time in the AS mission time.	A discussion of the 24-hr mission time has been added to the Sequence Analysis notebook. Other mission times are documented in system notebooks. HFEs associated with each safety function have also been added to Success Criteria tables under the Operator Actions column.	IE resolution applies to the Fire PRA; IE mission times also used in the Fire PRA.
SC-B2 (SC-B2)	SR Met: (CC I) B	Use of 1 CFT as success criteria for LLOCA rather than the 2 specified in the FSAR is an unsubstantiated assumption.	Conduct TH assessment of the LLOCA to verify adequacy.	See SC-A4	The LLOCA success criteria is N/A to the Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SC-B4 (SC-B3)	SR Not Met A	There is a potential problem with the Medium LOCA success criteria. Draft calc C-NSA-99.16-055 states that the min ECCS for a CFT LOCA is 1CFT, 1 LPI (rec) and 1 HPI (inj) and this event is 0.44ft^2 which makes it a MLOCA. This event, however, defeats one ECCS train. This event should be examined further to determine whether it should be explicitly included in the PRA model. Several draft, unofficial calcs have been developed and performed that document many of the success criteria. These documents are not referenced because they are uncompleted calcs. The PRA configuration control process should be modified such that these calcs can be included as references.	Modify the PRACC process to include the draft calcs (e.g., C-NSA-99.16-054) so they can be referenced, maintained, etc.	The effect of a core flood line medium LOCA on LPI is in the PRA model. It has also been accounted for in a MLOCA - MAAP Success Criteria run. The model and notebook have been updated to reflect 1 of 2 CFTs required. The Sequence tables have been updated to include a Basis column with the applicable reference - USAR, MAAP, etc.	The MLOCA success criteria is N/A to the Fire PRA.
SC-B4 (SC-B4)	SR Not Met D	Using MAAP 4 for the success criteria evaluation in conjunction with FSAR, BWROG calcs. FAI did the parameter file for MAAP 4. No general description of process for use of code. No documentation of limitations.	The use of MAAP 4/FSAR/generic analyses appears valid. The missing item is the verify. that the code/ models were used only within the ranges of applicability. This could be documented in a process description for the performance of MAAP analyses and each MAAP analysis should document that this requirement is satisfied.	See SC-A2. Also, Appendix A of the Sequence Analysis notebook summarizes the MAAP calculations and results, and includes a discussion on code use and limitations.	IE resolution applies to Fire PRA; In addition, the Fire PRA Model notebook discussed DAFW and FLEX, including associated success criteria and MAAP runs (see Section 6 and attachment B).

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SC-B5 (SC-B5)	SR Not Met D	No indication of checks of reasonableness/comparisons with other studies.	Perform a comparison of TH results with other plants' results. Document the comparison.	Section 12 of the Sequence Analysis notebook includes a comparison to other PRAs.	Based on ASME/ANS RA-Sa-2009 for FQ-E1(c), a comparison to similar plants is not applicable. Also, as specified in Note 1 - there is no requirement for a comparison of fire PRA results for similar plants due to lack of Fire PRA results using the updated industry Fire PRA methods. Additionally, small differences in geometry, plant layout, and the Fire Safe Shutdown Procedures may result in significant differences in risk that may be difficult to understand without detailed Fire PRA results from plants being compared.
SC-C1 (SC-C1)	SR Not Met D	Documentation does not readily facilitate reviews. Organize success criteria in a SC document: identify functions, systems, human actions, and specific sources for each info needed (generic, MAAP run, etc.).	None provided.	The Sequence Analysis notebook has been re-organized and enhanced. The notebook includes sections for each IE class and includes the ET and success criteria. Operator actions, EOP sections, safety function top gates, and fault tree tops have been added to the Success Criteria tables. The Sequence tables include USAR and MAAP references.	IE documentation gap is N/A to the Fire PRA. The Fire PRA notebooks were organized into Component Selection; Fire Response Modeling, Human Reliability Analysis, Qualitative Screening, Quantification, and Sensitivities and Uncertainties.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SC-C2 (SC-C2)	SR Not Met D	Processes are not documented. Core damage is defined by inference.	None provided.	A methodology section has been added to Sequence Analysis notebook; and includes the definition of core damage, and discussion of the 24 hr mission time.	IE resolution applies to the Fire PRA; IE definitions are applicable to the Fire PRA.
SC-C3 (SC-C3)	SR Not Met D	Assumptions and sources of uncertainty need to be documented.	None provided.	The Sequence Analysis notebook includes a section on assumptions. Also, the Quantification notebook (and Level 2 notebook) includes a compilation of key sources of model uncertainties.	Section 3 of the Fire PRA Model notebook identifies Fire PRA model assumptions. Also, as discussed in Fire PRA SR UNC-A1-01, the Fire Uncertainty and Sensitivity Notebook contains a comprehensive list of assumptions, meaningful sensitivities, and distributions for both CDF and LERF, and should be used as a template.
SY-A1 (SY-A1)	SR Not Met B	Many systems have missing information in the models	Review/update models	All system models and notebooks have been updated. The system notebooks were re-structured to support the ASME requirements. Appendix F of the PRA Modeling Guidelines notebook includes a cross reference for section in the system notebook to the ASME requirements addressed in that section. Appendix I of the PRA Modeling Guidelines notebook includes the systems analysis ASME self-assessment.	IE resolution applies to the Fire PRA. In addition, the Section 3 of the Fire Response Model notebook identifies Fire PRA model assumptions and Section 6 describes modeling of the DAFW and FLEX.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SY-A3 (SY-A3)	SR Not Met B	Some portions are missing, others are incomplete. For example, CCW includes a description of pump start, but does not mention I&C requirements for other components in the system [c]. Testing and maintenance practices discussion should be expanded [d]. CCW modeling does not include isolation of non safety loads on SFAS signal.	Ensure all actuation signals are model and discussed in the documentation. Include documentation of engineering analysis that justifies not including the non-safety loads on SFAS actuation. .	See SY-A1. Also, system notebook Section 2 covers Actuation and Control, Section 3 covers success criteria, Section 4 covers support systems, Section 10 covers maintenance/testing.	IE resolution applies to the Fire PRA. Also, a review of power supply, interlock circuits, instrumentation, and support system dependencies was performed in the NFPA 805 Interim Transition Report.
SY-A4 (SY-A4)	SR Met: (CC I) C	Meets Capability Category I only. The original model was developed and reviewed by formerly licensed personnel with knowledge of the as-built, as-operated plant. No walkdowns were performed.	Perform and document walkdowns to verify the system models reflect the as-built, as-operated plant. Conduct interview with system engineers and plant operators to confirm the system models are complete and correct.	As discussed in the PRA Modeling Guidelines, walkdowns and discussions/reviews with plant personal were conducted. It describes recent walkdowns in support of the fire and flood PRA analysis, and a full day meeting with 2 System Engineering supervisors to review all systems.	Numerous walkdowns were performed for the Fire PRA (e.g., C-FP-013.10-007, “Fire PRA Task 1 - Plant Boundary Definition and Partitioning;” C-FP-013.10-018, “Fire PRA Cable Selection;” C-FP-013.10-008, “Fire Ignition Frequencies;” C-FP-013.10-058, “ARS-DB-13-074, Substantial Barrier Qualification,” etc.).
SY-A8 (SY-A8)	SR Not Met D	Component boundaries are implied but not documented. The implementation of component boundaries appears to have been done correctly and consistently, however there is no documented description.	Provide documented component boundaries and verify that these have been implemented correctly in the system models. Refer to data notebook for component boundaries.	The PRA Modeling Guidelines notebook, Appendix C, provides details of component boundaries.	IE resolution applies to the Fire PRA. In addition, as discussed in the Fire PRA Component Selection, the Fire PRA included cable routing and circuit analysis for active components.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SY-A14 (SY-A13)	SR Not Met B	C and SW fault trees do not include failure of the motor circuit breaker to close when checking for start files for the #3 (spare) pump.	None provided.	The SW and CCW trees have been completely restructured. Pump failure modes are correctly modeled and discussed in system notebooks.	The Fire PRA model includes the IE resolution.
SY-A17 (SY-A16)	SR Not Met B	In the SFAS System notebook, SFAS Level 5 actuation appears to be incorrectly modeled compared to the as-operated plant. A human error is ANDed with failure of SFAS 5 actuation. This implies a manual backup to an automatic actuation. This should be an OR gate, since the actuation is not automatic. In addition, the human error may be incorrect since it should also include an ex-control room action to rack-in breakers.	Add appropriate human actions to the model and correct the fault tree logic.	The human action (ZHASFASR) that is ANDed with the SFAS 5 actuation is the failure to manually initiate SFAS 5 if it fails to automatically actuate (e.g., CCF of BWST level transmitters). The SFAS 5 permissive is needed before the subsequent human action to switch the suction from the BWST to the sump can be taken (e.g., XHALPRAE, XHAHPRRE which involve local actions to rack-in breakers).	The Fire PRA model includes the IE resolution.
SY-B1 (SY-B1)	SR Not Met A	Check Valve common cause is not modeled consistently. The system modeling guideline describes a process for identifying grouping. The system notebooks identify the groups modeled but many systems do not include check valve CCF (e.g., AFW, Containment Spray). Containment Spray notebook states "Common cause failures of other components including manual valves and check valves were not considered probable and therefore not included in the tree." CCF for HPI check valves were included, however. The grouping process should be consistently applied. Check valve CCF has occurred.	Rebuild common cause	As discussed in the Common Cause Data notebook. the common cause modeling has been changed to use the CAFTA common cause function; the data (MGL) has been updated and now uses WOG or NRC data; the modeling of common cause failures in fault trees has been updated; and the mutually exclusive file has been updated.	The Fire PRA model includes the IE resolution.
SY-B4 (SY-B4)	SR Not Met B	Common cause is not fully developed MGL	Expand common cause to full MGL approach.	See SY-B1	See SY-B1

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SY-B5 (SY-B5)	SR Not Met A	During review of the CCW system notebook it was noted that the CCW pumps (43-1, 43-2, and 43-3) do not include a DC-power dependency. During review of the SW system notebook, it was noted that the spare SW pumps (3-3 and P2-3) do not include a DC-power dependency.	Review support system dependency and correct any dependency deficiencies in the models.	The SW and CCW trees have been completely restructured. Dependencies have been reviewed and included as appropriate. Dependencies in all system trees have also been reviewed and added where necessary. Fault tree modeling of necessary changes is complete. Section 4 of the system notebooks discusses support systems; Section 14 includes modeling assumptions. As discussed in CCW notebook Section 4, D1P provides control power to the pump 1 breaker (or 3 as 1) and D2P provides control power to the pump 2 breaker (or 3 as 2). As discussed in the SW notebook Section 4, a loss of breaker control power will prevent the spare SW pump or Dilution pump breaker to close.	The Fire PRA model includes the IE resolution.
SY-B9 (SY-B10)	SR Not Met D	During review of the CCW system notebook it was noted that the CCW pumps (43-1, 43-2, and 43-3) do not include a DC-power dependency. During review of the SW system notebook it was noted that the spare SW pumps (3-3 and P2-3) do not include a DC-power dependency. There-fore, this SR was not satisfied for item (b).	See SY B5	See SY-B5	See SY-B5

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SY-B10 (SY-B11)	SR Not Met B	Not all permissives and lockouts checked could be found, specifically UV signal preventing closure of the EDG output breaker and concurrent SFAS 2 signal and UV signal for the sequencer. No justification for not including these does not meet Category I. Not modeling results in Category 2 not being met.	Ensure all permissives and lockouts are modeled.	As discussed in the EDG system notebook, although the EDGs receive start signals from C1 (D1) undervoltage relays and on an SFAS Level 2 actuation, these signals are not modeled. If an EDG failed to start due to a failure of the undervoltage signal, operators could still manually start the diesel, and would be directed to do so by procedures. The likelihood that both the automatic signal and operator action fail is much less than the failure rate of the diesel to start, and is therefore not modeled. The SFAS signal is not modeled because the diesels are not needed in an SFAS situation unless an undervoltage exists on their respective bus.	The Fire PRA model includes the IE resolution.
SY-C1 (SY-C1)	SR Not Met D	Documentation not structured for efficient review. A number of documentation discrepancies and errors were noted as described below.	None provided.	See SY-A1	See SY-A1
SY-C2 (SY-C2)	SR Not Met D	Component boundary definitions are not included. System diagrams do not show model boundaries.	Include definition of component boundaries. Mark system drawings to show model boundaries	See SY-A8. Also, each system notebook includes an appendix of system drawings with highlights showing the system boundaries.	See SY-A8

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
SY-C3 (SY-C3)	SR Not Met D	No discussion of key assumptions and key uncertainty could be found.	See IE SR	Section 14 of each system notebook and section 2 of the PRA Modeling Guidelines notebook include assumptions. Also, the Quantification notebook (and Level 2 notebook) include a compilation of key sources of model uncertainties.	IE resolution applies to the Fire PRA. The Fire Response Model notebook includes assumptions, and the proposed DAFW and FLEX mods. Also, as discussed in Fire PRA SR UNC-A1-01, the Fire Uncertainty and Sensitivity Notebook contains a comprehensive list of assumptions, meaningful sensitivities, and distributions for both CDF and LERF, and should be used as a template.
DA-A2 (DA-A1a)	SR Not Met D	There is no discussion of component boundaries in the data documentation.	Add definitions to Data Notebook.	Data notebook V1, Section 3 discusses component boundaries and references the Modeling Guidelines notebook. Appendix C of the PRA Modeling Guidelines notebook includes component boundaries.	IE resolution applies to the Fire PRA.
DA-B1 (DA-B1)	SR Met: (CC I) B	Meets capability category I. To meet Category II, need to include consideration of service conditions. To meet Category III, need to include consideration of service conditions and environmental conditions.	Add consideration of service conditions when grouping components for parameter estimation for determining plant specific failure rates.	A discussion of component grouping for parameter estimation was added to the Data notebook V1 - see Section 3. Valve data was also separated by system and evaluated; the results concluded no need to separate the data - see the discussion included in Data notebook V1.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.
DA-C1 (DA-C1)	SR Not Met B	Generic data sources are outdated. Update using latest generic data. (See NUREG 6928)	Replace the old generic data in the calculations for data with the new.	As discussed in Data notebook V1, the data was updated using current NUREG-6928 generic data.	The Fire PRA model includes the IE resolution. The Fire PRA uses the same generic data - NUREG-6928 data – for the DAFW and FLEX.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
DA-C3 (DA-C3)	SR Not Met D	Demands documented for air valves are identified as "Assumed" though the basis is the number of times tests were conducted. Use of the term "Assumed" should be explained.	This implies the denominator is an assumed value. The data is not assumed, it is from the scheduling of tests. It is probably conservative because there are component demands that may not be capture.	The word 'assumed' is better represented by the word 'estimated' as it was used in the data worksheets to compile the number of demands for each component based on applicable tests and demands. As discussed in the Data notebook V1, the data sheets include the raw data used to generate component failure rates.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.
DA-C4 (DA-C4)	SR Not Met D	There is no description of the approach used to determine/define failures. Degraded states were not mentioned. The Event Summary Sheet does not provide an indication of complete vs. degraded failure.	Document the analysis process such that it explicitly addresses consideration of degraded conditions. To demonstrate that this consideration is addressed, include a checkbox on the form that indicates whether the failure is a full failure or a degraded condition that is PRA failure.	A discussion of a component failure versus a degraded state has been added to the Data notebook V1. Consideration will also be given to identifying future events as failures or degraded conditions.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
DA-C13 (DA-C12)	SR Not Met B	The TM data update uses data from essentially two sources; MSPI data from, 4/30/04 through 4/30/07, and Maintenance Rule data from Cycle 14. In both cases, the train/component out-of-service hours (i.e., the numerator in the TM calculation) appears to only include out-of-service hours when the train was required, or when the plant was at-power, which is compliant with this SR. However, for equipment/trains for which Maintenance Rule data was used, it appears that the denominator in the TM unavailability calculations do not correspondingly consider the time that the equipment was required or that the plant was at power. Instead, the exposure variable (the denominator) is essentially calendar time. This is incorrect. In addition, the plant-specific TM data is too sparse, particularly the Maintenance Rule data, which is only from Cycle 14. Use of the Cycle 14 data only also creates a problem for certain components, such as the PORV and SW pump room vent fans, since they had no out-of-service hours in Cycle 14, so the TM data point calculated is 0.0. (This is the value that was input into the actual PRA model.) This is clearly incorrect, and, if corrected (i.e., non-zero values were calculated from other operational periods), could result in an increase in CDF or LERF. Therefore, a "B" significance was assigned.	Suggest that the following tasks be undertaken with regard to the TM data: (1) Enlarge the timeframe for which TM data is collected. One cycle is insufficient for a plant of this vintage. (It is recognized that data from early cycles could be omitted from the data update.) This should also correct the issue with the use of zero TM point estimates. (2) The exposure time/ denominator used to calculate the TM point estimates should be the time that the equipment in question was required (e.g., by Tech Specs) or the time that the plant was at power, not calendar time.	The Testing/Maintenance (TM) events that are based on MR data have been revised based on critical hours (i.e., not total hrs). A comparison was also performed against previous unavailability probabilities and generic data to ensure reasonableness and general consistency. The comparison to previous data showed similar results, so the TM data remains for only Cycle 14. There was no unavailability for the PORV or SW pump room vent fans in PRA Revision 5, Revision 4, or Revision 3; consideration will be given to removing these events from the model in the next update. Data notebook V2, covers TM Unavailability.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
DA-D4 (DA-D4)	SR Met: (CC I) B	There was no evidence that a check was made of the prior evidence. If fact, given the DA-D1 comment, the significant plant data suggests in some areas that a significant reduction in the failure rate would be achieved by using plant-specific data only. For example, AFW TDP generic fail to start probability is 2.08E-2/demand based on 700+ demands. Plant-specific fail to start probability is 9.29E-4/demand based on 537 demands. Bayes updated fail to start probability is 5.55E-3/demand.	Perform a data update.	A section was added to Data notebook V1 that discusses a check of the Bayesian updates. Also, as discussed, consideration will be given to using plant data alone to estimate failure rates as more plant data is collected.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.
DA-D5 (DA-D5)	SR Not Met B	MGL approach used. Use of CC module (random * mult) not the normal approach to common cause. Normally the two BEs in the CC modules are combined. This approach can lead to update errors as demonstrated by the CCW IE CC values and SW IE CC values. In CCW IE: WMPP432F is FTR value is 2.50E-5 in CC, WMPP43XF is 2.50E-4. In SW IE: TMPP301F is FTR, value is 7.13E-2 and in CC, SMPT121F is FTR, value 7.78E-2.	None provided.	See SY-B1	See SY-B1
DA-D6 (DA-D6)	SR Not Met D	The data in NUREG 6268 was used where possible and the data considered in the database was reviewed and screened for applicability to Davis-Besse. However, component boundaries are not defined so consistency between data evaluations and common cause cannot be evaluated. See DA-A1a.	See previous SRs	See DA-A2	See DA-A2

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
DA-D8 (DA-D7)	SR Not Met B	Plant specific failure rates use failure and operating/demand data since 1990. Operating practices since the extended shutdown are different than prior to the shutdown. This could skew the plant specific failure data.	Determine whether or not the change in plant op. and maint. practices since the extended shutdown have changed sign. enough the warrant separating pre- and post-shutdown data in the plant specific failure data analysis.	Plant specific data used in the PRA has been reviewed for applicability. As identified in the Data notebook V1, the data periods vary for different components based on changes in plant operations/maintenance.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.
DA-E1 (DA-E1)	SR Not Met D	Documentation is extensive, but there is no description of the process used for analyzing and updating data.	None provided.	A methodology section has been added to all the Data notebooks.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.
DA-E2 (DA-E2)	SR Not Met D	Component boundaries are not defined, no discussion of the prior distributions used for Bayesian updating.	None provided.	See DA-A2. Also, a section has been added to the Data notebook V1 on Bayesian updates, including a consistency check.	IE resolution applies to the Fire PRA.
DA-E3 (DA-E3)	SR Not Met D	No discussion of uncertainty could be located.	See IE SR	Each Data notebook includes a section listing assumptions. Also, the Quantification notebook (and Level 2 notebook) include a compilation of key sources of model uncertainties.	IE resolution applies to the Fire PRA. Also, as discussed in Fire PRA SR UNC-A1-01, the Fire Uncertainty and Sensitivity Notebook contains a comprehensive list of assumptions, meaningful sensitivities, and distributions for both CDF and LERF, and should be used as a template.
QU-A3 (QU-A2b)	SR Met: (CC I) D	Mean CDF is not estimated nor calculated. See QU-E3. The value for CDF from the current PRA is the point estimate.	Perform uncertainty analysis (See QU-E3)	The Quantification notebook includes mean CDF and LERF results in Section 6, along with the uncertainty analysis.	The Fire Uncertainty and Sensitivity notebook includes mean CDF and LERF results.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
QU-B1 (QU-B1)	SR Not Met D	CAFTA is used as the PRA analysis tool. However, the portion of the SR statement associated with limitations/features is not documented.	Modify the quantification guideline to include code limitations/ features. Update the guideline to reflect current practices.	Section 3 of the Quantification notebook discusses the codes used in quantification, including CAFTA. It includes a reference to the CAFTA user's manual for features and limitations. Limitations are also discussed in Section 7 of the Quantification notebook. Appendix B of the Quantification notebook includes the steps to quantify the model.	IE resolution applies to the Fire PRA. In addition, the Fire Risk Quantification notebook discusses FRANX limitations.
QU-B3 (QU-B3)	SR Not Met D	The convergence test is not demonstrated because Table 3 of the Quantification Notebook does not comply with the test definition (<5% with last decade reduction in truncation). The current model limit is 5e-13 for truncation and the decade 5e-12 to 5e-13 is not provided to demonstrate <5% change. LERF results show an even less convergence.	Quantify at lower truncation to evaluate the convergence.	Convergence is demonstrated and discussed in Section 4.3 of the Quantification notebook for CDF and LERF. Truncations were selected when changes in CDF and LERF were less than 5% with successive reductions in truncation of one decade.	Section 5 of the Fire Risk Quantification notebook discusses convergence.
QU-B7 (QU-B7a)	SR Not Met D	Identification of cutsets containing mutually exclusive events is accomplished by the listing the combinations of events that are not possible in the same cutset. This listing is provided in Attachment 3 of the Quantification Notebook. The subsection of Section 7 of the Quantification Notebook describe the types of combinations that are included in the mutually exclusive file. Additionally, the recovery process applies a JUNK term (value 0.00) to additional cutsets to complete the mutually exclusive process.	Provide additional documentation of the process to describe the rationale for elimination of sequences.	Section 4 of the Quantification notebook includes a discussion of the Mutually Exclusive File, which is also included in Appendix C. A discussion of mutually exclusive events is also included in each system notebook (Section 17), in the HRA notebook (Section 3), and in the Sequence Analysis notebook (Section 10).	IE resolution applies to Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
QU-B10 (QU-B9)	SR Not Met C	Modules are used in the modeling and basic event importances are being missed in the output.	Remove the module setting on all modules in the model. Remove discussion of modules from documentation.	The model does include some modules - primarily associated with lower risk components (e.g., passive valves), and used to support convergence. As discussed in Quantification notebook, Section 3.2.4, basic event importance was calculated using SysImp, which calculates the importance of events within modules (by regenerating cutsets for CDF and expanding modules for LERF).	IE resolution applies to Fire PRA; no new impact on Fire PRA.
QU-C1 (QU-C1)	No gap	Observation: No gaps. See HR-G7.	None provided.	As discussed in Section 4.2 of the Quantification notebook, 'seed' values were used for HEPs when generating cutsets to avoid truncating cutsets with combinations of HEPs.	IE resolution applies to Fire PRA; no new impact on Fire PRA.
QU-C2 (QU-C2)	SR Not Met D	HR Review needed. No other gaps identified.	None provided.	A detailed review of HRA dependencies is included in the HRA notebook, Section 3.3.	As discussed in Section 8 of the Fire PRA HRA notebook, the dependency analysis was performed using the HRA calculator for the Fire PRA.
QU-D1 (QU-D1a)	SR Not Met D	No discussion of this review could be located.	Perform a review of a sample of the significant accident sequences/cutsets sufficient to determine that the logic of the cutset or sequence is correct. Document the results of the review.	Cutset reviews were performed on a system level - and documented in Section 19 of the System notebooks. As described in the Section 5 of the Quantification notebook, cutset reviews were performed for dominant cutsets, non-significant cutsets, and on a sequence basis..	IE resolution applies to Fire PRA. Also, Section 4 of the Fire Risk Quantification notebook discusses the review of the fire risk results, including scenarios/cutsets contributing to Fire CDF and LERF.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
QU-D2 (QU-D1b)	SR Not Met B	No evidence that such a review was performed. This gap was assigned a significance level B due to the modeling inconsistencies discovered during the review of System Analysis, Accident Sequence, and Initiating Events.	Perform a consistency review of the model results. Identify and correct the inconsistencies found. Document the review and actions taken to correct inconsistencies.	As documented in the Quantification notebook Section 5, the PRA results were reviewed for modeling and operational consistency. System level cutset reviews were also performed and are documented in Section 19 of the system notebooks. A revision change summary is included with every notebook to document changes - including corrections. Section 7 of the Quantification notebook also discusses model limitations.	See QU-D1
QU-D3 (QU-D1c)	SR Not Met D	No evidence of such a review could be located.	Perform a review of the quantified results to determine that the flag event settings, mutually exclusive event rules, and recovery rules yield logical results. Document the review.	See QU-D2. Also, the Quantification notebook describes reviews by accident sequence, significant CDF and LERF cutsets, and non-significant CDF and LERF cutsets.	See QU-D1
QU-D4 (QU-D3)	SR Met: (CC I) D	No such review could be located.	Prepare a table to compare the results of the Davis-Besse PRA to PRA results of similar plants.	Section 5.4 of the Quantification notebook describes the comparison to similar plants; it includes a comparison of CDF and LERF.	See SC-B5
QU-D5 (QU-D4)	SR Not Met D	No such review could be located.	Perform a sampling of nonsignificant accident cutsets or sequences to determine they are reasonable and have physical meaning. Document the results of the review.	Sections 5.3.2 and 5.3.4 of the Quantification notebook document the non-significant cutsets review for CDF and LERF.	IE resolution applies to Fire PRA. Also, Section 4 of the Fire Risk Quantification notebook discusses the review of randomly selected scenarios, including low contributors to Fire CDF.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
QU-D6 (QU-D5a)	SR Not Met D	The contributions to CDF of top ten IEs, top ten human actions, top ten systems, top ten components, top ten unavailabilities are provided in the Quantification Notebook. This information, however, is provided as "Sensitivity Cases." This information does not consider the ASME Std definition of "significant" and it indicates an erroneous definition of the term "sensitivity."	Write a new PSA Summary Report for the most recent version of the PRA. Include the amount of detail needed to satisfy the definition of "Significant." Revise the Quantification Report to remove the importance assessments for the section entitled "Sensitivity Cases" so that sensitivity analyses are reported under that title.	Section 5 of the Quantification notebook summarizes the results. Section 5.1.1 provides a table of results by IE, sorted by contribution to CDF. Section 5.1.2 provides results by accident sequence, including a table of results by accident sequence, sorted by contribution to CDF. Section 5.1.3 provides system importance results, including a table of Maintenance Rule systems sorted by Fussel-Vesely (FV), a bar graph of the top 10 systems sorted by Risk Achievement Worth (RAW), a plot of FV and RAW, and a table with High risk systems and Medium risk systems. Section 5.1.4 provides results by component importance and refers to Appendix H (which includes several measures of risk ranking). Section 5.1.5 provides operator action insights and refers to Appendix N. Section 5.1.6 provides basic event risk insights and refers to Appendix I. Components, basic events, and operator actions are classified as risk significant if RAW > 2.0 or FV > 0.005. The PRA Modeling Guidelines notebook provides definitions for several 'significant' PRA elements. Similar LERF results are included in Section 5.2.	IE resolution applies to Fire PRA. Also, Section 4 of the Fire Risk Quantification notebook shows significant systems, basic events, and human actions.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
QU-D7 (QU-D5b)	SR Not Met D	There is no evidence of having reviewed the importance of components and basic events to determine that the results make logical sense.	Review importance results (basic event & components) to demonstrate results are consistent with expectations.	See QU-D6. Also, several System importance comparisons were made against the previous model results to ensure the results were reasonable (see tables and figures in Section 5.1.3).	IE resolution applies to Fire PRA. Also, the Fire Risk Quantification notebook includes reviews of system and component importance, and significant HFEs.
QU-E1 (QU-E1)	SR Not Met D	There is not qualitative uncertainty assessment	See IE SR	Section 6 of the Quantification notebook identifies sources of model uncertainties and includes a formal propagation of uncertainty.	IE resolution applies to Fire PRA. Also, the Fire Uncertainty and Sensitivity Notebook identifies and characterizes uncertainties throughout the DBNPS Fire PRA.
QU-E2 (QU-E2)	SR Not Met D	There is not collection of assumptions regarding model development	See IE SR.	Each notebook includes a section to document assumptions. Section 2 of the Quantification notebook covers assumptions. Section 6 of the Quantification notebook also discusses parameter uncertainty and model uncertainties. Sensitivity studies are included in Section 6.3. In addition, the Level 2 notebook identifies sources of Uncertainty and includes several Level 2 sensitivities.	IE resolution applies to Fire PRA. Also, the Fire PRA notebooks also include Assumption sections.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
QU-E3 (QU-E3)	SR Not Met D	There is no quantitative uncertainty analysis for the D-B PRA.	Complete assigning distributions to the basic events, making sure that like components are assigned the same type code (so that the state of knowledge correlation is applied to similar components). Conduct an uncertainty analysis (e.g., using UNCERT). Document the process and results.	The uncertainty analysis included is the Quantification notebook, Section 6.	The Fire Uncertainty analysis is included in Section 6 of the Fire Uncertainty and Sensitivity Notebook.
QU-E4 (QU-E4)	SR Not Met D	There are no sensitivity analyses documented in the PSA information.	ASME Std QU-E4, Note 1 states: "For specific applications, key assumptions and parameters should be examined both individually and in logical combinations. "Review the baseline model and PRA applications, identify the assumptions/ parameters that tend to drive the results and perform sensitivity analyses on these assumptions/ parameters by varying the PRA value for these and examining the PRA results.	Sensitivity studies are documented in Quantification notebook Section 6.3. Also, Level 2 sensitivities are documented in the Level 2 notebook, Section 8.	The Fire sensitivity studies are included in Section 6 of the Fire Uncertainty and Sensitivity Notebook.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
QU-F1 (QU-F1)	SR Not Met D	No documentation of incorporation of success stated in the model (although successes appear to be correctly treated via PRAQUANT file). There are several items missing (see previous SRs)	Describe the modeling of each sequence including successes. The overall quant. should be described. There is no other location in which the sequence top logic is fully described. The failure portion of the sequences is depicted (but not described) in the Sequence notebook but the SUCCESS portion of the logic is not captured.	In addition to the Success Criteria tables in the Sequence Analysis notebook identifying top gates and human actions, a Success Logic table is included for each event tree. These tables identify the success gates associated with each accident sequence. As shown in the DBNPS top logic file, successes are modeled in sequence logic via NOT gates. The Quantification notebook describes in detail the process to solve the model.	IE resolution applies to Fire PRA
QU-F2 (QU-F2)	SR Not Met D	See QU-F1	None provided.	Details of the process to quantify the model are included in Section 4.1.1 and Appendix B. The Quantification notebook, including tables and attachments, has been structured to support ASME SRs, with the intent to facilitate PRA applications, peer reviews and upgrades.	IE resolution applies to the Fire PRA. Also, the Fire PRA Model notebook describes the procedure for developing and quantifying the Fire risk model.
QU-F3 (QU-F3)	SR Not Met D	Significant contributors not fully captured (See QU-D5a). Significant sequences need to be described.	Revise Quantification and PSA Summary notebook to include the info. in QU-D5a as well as the info. included in this SR.	See QU-D6	See QU-D6

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
QU-F4 (QU-F4)	SR Not Met D	No discussion of assumptions and sources of uncertainty.	Document the assumptions and sources of uncertainty.	See QU-E2	See QU-E2. Also, as discussed in Fire PRA SR UNC-A1-01, the Fire Uncertainty and Sensitivity Notebook contains a comprehensive list of assumptions, meaningful sensitivities, and distributions for both CDF and LERF, and should be used as a template.
QU-F5 (QU-F5)	SR Not Met D	No discussions of the limitation of the quantification process.	Document any limitations of the quantification process that may impact use of PRA for applications.	Limitations are explicitly addressed in Section 7 of the Quantification notebook. Level 2 limitations are discussed in Section 7 of the Level 2 notebook.	IE resolution applies to the Fire PRA; FRANX limitations are discussed in the Fire Quantification notebook.
QU-F6 (QU-F6)	SR Not Met D	No definition is provided.	Provide a definition of the term "significant basic event"	Definitions have been added to the PRA Modeling Guidelines notebook, including 'significant basic event' and 'significant contributor', 'risk-significant equipment', 'significant accident progression sequence', and 'significant cutset'. Also, as discussed in Section 5 of the Quantification notebook, components, basic events, and operator actions are classified as risk significant if RAW > 2.0 or FV > 0.005.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.
n/a (MU-A2)	SR Not Met D	There is no description of this requirement in the PRA Program Guidelines, however, discussions with the PRA staff indicate that this is being done.	Revise PRA Program Guidelines to include this requirement.	A section has been added to the PRA Modeling Guidelines notebook referencing and highlighting key elements of the PRA Program and PRA Business Practice.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
n/a (MU-B3)	SR Not Met D	Current Guidelines were written prior to the issuance of the ASME PRA Standard. However, all PRA staff contacted were aware of the Standard and the requirements that must be used when performing updates and upgrades.	Revise all PRA Guideline documents to require all PRA revision work to be performed in accordance with the PRA Standard.	A self-assessment of the ASME standard has been performed; each element (e.g., QU, LE) is included in the applicable DBNPS PRA notebook.	IE resolution applies to the Fire PRA; in addition, a Fire self-assessment against the ASME standard Part 4 has also been performed and is documented in the respective Fire PRA notebooks (e.g., 10-01 - ES, 10-03 - HRA, 10-05 - QU, etc.).
n/a (MU-B4)	SR Not Met D	There is no direction provides in the PRA Program Guidance, however the PRA staff is aware of the requirement and is scheduling a peer review based on the current update and upgrade plans.	Revise PRA Program Guidelines to require the appropriate review follow updates and upgrades to the PRA model.	A section has been added to the PRA Modeling Guidelines notebook to reference the PRA Program Manual (PM) and PRA Business Practice (BP). The objectives in the PM & BP satisfy NRC RG 1.200 requirements, which endorse peer reviews.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.
n/a (MU-C1)	SR Not Met B	Current program guidance requires an individual assessment for each issue, but does not require an assessment of the aggregate impact.	Revise PRA Program Guidance to provide tracking of all identified issues. Require an evaluation of the aggregate impact each time a new open issue is added to the list.	As discussed in Section 5 of NOBP-CC-6001, PRA Model Management, a system for identifying, tracking and dispositioning plant changes that may affect the PRA model shall be implemented at each site. At DBNPS, in accordance with NOP-CC-2004, Design Interface Reviews and Evaluations (DIE), the PRA team performs DIE reviews to captures design changes. Changes that impact the PRA program require generation of a notification, an evaluation of the aggregate impact, and incorporating the changes into a working model.	IE resolution applies to the Fire PRA; no new impact on Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-A1 (HR-A1)	Gap NC	Peer Review Observation: Misalignment pre-initiator HFEs are modeled for individual trains and also for systems with redundant trains. A review of procedures and practices is limited to those events that "…surfaced as potentially important…". The Davis-Besse approach of identifying pre-initiators based on risk significance is acceptable for the assumed configuration in the PRA. However, risk significance can be a sensitive function of configuration; therefore the identification process should be repeated for each PRA configuration change. Alternatively, the review of procedures etc. can be done comprehensively for all pre-initiators.	Recommendations: (1) Identify risk significant pre-initiator HFEs based on the criteria in R.G. 1.200 i.e. HFEs with FV ≥ 5E-03 OR RAW ≥ 2. (2) Perform review of procedures and practices for any new HFEs identified. OR (3) Perform review of procedures and practices for all equipment modeled in the PRA to identify activities that realign equipment out of the alignment assumed in the PRA. (Also need HR-B1, HR-B2)	As described in the HRA notebook, Section 2, the identification of pre-initiator HFEs included a detailed review of operating experience and procedure and calibration activities that could leave a system unavailable as a result of human error. Appendix A includes details of the reviews including: Table 1 - Condition Reports Screened; Table 2 - Condition Reports for Further Consideration; Table 3 - Operational Review of Human Performance Success Clock Resets; Table 4 - Maintenance and Test Procedures; Table 5 - Summary of Operating Experience and Procedure Review by System; and Table 6 - Evaluation of Locked Valves.	IE resolution applies to the Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-A2 (HR-A2)	Gap NC	Observation: Miscalibration pre-initiator HFEs are modeled for various actuation signals. These were identified on a risk significant basis as above in HR-A1.	Recommendations: (1) Identify risk significant pre-initiator HFEs based on the criteria in R.G. 1.200 i.e. HFEs with FV ≥ 5E-03 OR RAW ≥ 2. (2) Perform review of procedures and practices for any new HFEs identified. OR (3) Perform review of procedures and practices for all non-diverse signals modeled in the PRA to identify potential miscalibration activities (Also need HR-B1, HR-B2)	See HR-A1. Also, the SFAS system includes a set of miscalibration HFEs, though there have been no actual miscalibrations. Appendix A includes the calibration procedures.	IE resolution applies to the Fire PRA.
HR-A3 (HR-A3)	No gap	Observation: No gaps identified.	Include in HR-A1 if comprehensive procedure review is performed. Calibration activities, by definition, would impact redundant trains.	The HRA update included procedure review; see HRA notebook Section 2 and Attachment 5. Station procedures for "Conduct of Operations" or "Conduct of Maintenance" precludes the use of the same set of M&TE on separate trains of equipment.	IE resolution applies to the Fire PRA.
HR-B1 (HR-B1)	No gap	Observation: No gaps identified. Screening is not performed as such, but identification is based on risk significance (see HR-A1). Screening criteria are developed in Section 2.2, but are apparently not applied to the screening of procedures in Table 5.	(1) Develop screening criteria if HR-A1 and HR-A2 are performed on a comprehensive basis. (2) Screen misalignment activities identified in HR-A1 (3) Screen diverse signals identified in HR-A2	The HRA notebook identifies the screening criteria (Section 2) and the Attachments identify criteria used. Procedures requiring additional evaluation are addressed in Appendix A.	IE resolution applies to the Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-B2 (HR-B2)	No gap	Observation: No gaps. Six such HFEs are defined in Table 3 + many miscalibration HFEs.	None provided.	The HRA notebook Section 2 and Appendix A describe screening.	IE resolution applies to the Fire PRA.
HR-C1 (HR-C1)	No gap	Observation: No gaps. See Table 3 in summary report.	(1) If comp. procedure review is performed, define HFEs for new activities that survive the screening process. (2) Delete current HFEs for activities that are screened out.	Plant-specific operational practices were reviewed as described in HRA notebook Section 2 and Appendix A; individual HFEs were developed for pre-initiators as applicable.	IE resolution applies to the Fire PRA.
HR-C2 (HR-C2)	Gap NC	Observation: No evidence of operating experience review.	Perform review of plant specific licensee event reports of the last 10 years, or period that reflects current operating procedures and practices. This review could be supplemented by review of other plant records.	See HR-A1. Also, the Condition Report data would include any LERs or operating reports sent to INPO. Appendix B of the HRA notebook identifies the list of pre-initiator HFEs modeled.	IE resolution applies to the Fire PRA.
HR-C3 (HR-C3)	No gap	Observation: No gaps. See Table 3 in summary report.	(1) If comprehensive procedure review is performed, define HFEs for new activities that survive the screening process. (2) Delete current HFEs for activities that are screened out.	The HRA update include a comprehensive procedure review; see Appendix A. Pre-initiator HFEs are listed in Appendix B.	IE resolution applies to the Fire PRA.
HR-D1 (HR-D1)	No gap	Observation: No gaps. ASEP is used.	None provided.	The HRA calculator was used, including both THERP and ASEP.	IE resolution applies to the Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-D2 (HR-D2)	Gap NC	Observation: ASEP is used for pre-initiator quantification.	Recommendations: Use THERP for significant HFEs	As discussed in HRA notebook Section 2, the HRA Calculator was used for all pre-initiator HFEs, and THERP was used for all HEPs.	IE resolution applies to Fire PRA.
HR-D3 (HR-D3)	Gap NC	Observation: Not explicitly done as part of ASEP. I think a bit more is needed to strengthen the argument that procedure quality is adequate. Perhaps citing the procedure writing guide/ policy/ procedure, or referring to INPO certification / QA audit findings.	Recommendations: (1) Use THERP for detailed assessments (2) Make a general statement regarding the adequacy of the quality of procedures and administrative controls	HFEs in the HRA calculator were updated to identify applicable written procedures and administrative controls. As discussed in the HRA notebook, procedures continue to improve and are judged to be high quality - the operating experience review supports this conclusion. The assumptions were also enhanced with a discussion of human factors - both the man-machine interface and the man-procedure interface, as well as the efforts to improve human performance. Pre-initiator HEP reports are included in the HRA notebook, Appendix B.	IE resolution applies to Fire PRA. In addition, as discussed in the Fire PRA HRA notebook, additional procedures (e.g., Serious Control Room Fire, Serious Station Fire) were reviewed to address the fire impact on HFEs. The Fire HFEs also identify applicable procedure, administrative controls, and assumptions.
HR-D4 (HR-D4)	Gap NC	Observation: ASEP has a predefined set of recovery factors. HRA Calculator database "HRA Pre-initiator rev 0.HRA"	Recommendation: If THERP is to be used for detailed assessments, limit the number of recovery factors consistent with those in ASEP.	The HRA Calculator was used for all the pre-initiators and is a detailed assessment. Generally, independent verification is used during test procedures. Multiple recoveries were not used. Pre-initiator HEP reports are included in the HRA notebook, Appendix B.	IE resolution applies to the Fire PRA.
HR-D5 (HR-D5)	Gap NC	Observation: ASEP has a predefined set of recovery factors. HRA Calculator database "HRA Pre-initiator rev 0.HRA"	Recommendation: If THERP is to be used for detailed assessments, identify and treat dependencies appropriately.	Because the same I&C crew does not do multiple tests in one shift, and different M&TE is used for each train, a pre-Initiator dependency analysis was not performed. As discussed in the HRA notebook, dependency was considered for post-initiator HFEs.	IE resolution applies to the Fire PRA.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-D6 (HR-D6)	Gap NC	Observation: Uncertainty is expressed via error factors. Median HEPs are used.	Recommendation: Convert median HEPs to mean HEPs.	The HEPs were assessed using the HRA calculator and include uncertainty. Point estimates use HEP mean values. Pre-initiator HEP reports are included in the HRA notebook, Appendix B.	IE resolution applies to the Fire PRA; all fire HFEs were also assessed using the HRA calculator and include uncertainty. Attachment C of the Fire HRA notebook shows the mean HEP value along with the Error Factor.
HR-D7 (HR-D7)	No gap	Observation: No gaps identified.	None provided.	A "Reasonableness" check was made and plant operating experience reviewed.	IE resolution applies to the Fire PRA; Fire HEPs were similarly reviewed for 'reasonableness' against plant operating experience.
HR-E1 (HR-E1)	No gap	Observation: No gaps. See p. 5 of summary report. See “Procedural Guidance” and “Context” sections of individual analysis files in spreadsheets. However, concern expressed during meeting on April 9, 2008, regarding the completeness of the identification performed historically.	Recommendation: Identify new actions that are required as a result of changes in procedures or operating practice, modifications, or success criteria since the IPE.	In reviewing HEPs for the update, the current EOP and abnormal procedures were used.	IE resolution applies to the Fire PRA. In addition, as discussed in the Fire PRA HRA notebook, additional procedures (e.g., Serious Control Room Fire, Serious Station Fire) were reviewed to address the fire impact on HFEs.
HR-E2 (HR-E2)	No gap	Observation: No gaps. See Table 9 in summary report. However, concern expressed during meeting on April 9, 2008, regarding the completeness of the identification performed historically.	Recommendation: Identify new actions that are required as a result of changes in procedures or operating practice, modifications, or success criteria since the IPE.	Current procedures were used to identify and assess HEPs. Appendix A of HRA notebook details reviews of plant data; Tables 4 & 5 address procedure reviews.	See HR-E1

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-E3 (HR-E3)	No gap	Observation: No gaps identified.	None provided.	As discussed in the HRA notebook, Section 4, operator interviews were conducted to support the HRA in addition to observation of simulator drills. The HRA analysis was performed by a PRA analyst who was a previously licensed SRO at DBNPS.	IE resolution applies to Fire PRA. Also, as discussed in the resolution to Fire Peer Review F&O HRA-A4-01, details of the operator interviews have been included in the HFE evaluations in the HRA Calculator, which are included in Attachment C of the Fire PRA Human Reliability Analysis notebook.
HR-E4 (HR-E4)	No gap	Observation: No gaps. See p.5 for type CP HFEs.	Recommendation: Perform simulator observations or talk throughs for any new operator actions identified in HR-E1, HR-E2	As discussed in HRA notebook Section 4, operator interviews, and simulator observations, were conducted to support the HRA.	IE resolution applies to the Fire PRA. Section 11 of the Fire HRA notebook discusses operator interviews and simulator observations performed in support of the Fire PRA. See also HR-E3.
HR-F1 (HR-F1)	No gap	Observation: No gaps identified.	Recommendation: Define HFEs for any new operator actions identified in HR-E1, HR-E2.	All HFEs are defined and developed in the HRA calculator; the HRA notebook includes appendices with HFE reports.	IE resolution applies to the Fire PRA. All Fire HFEs were also developed in the HRA calculator, and documented in Attachment C of the Fire HRA notebook.
HR-F2 (HR-F2)	Gap NC	Observation: For in-control room actions, the execution tasks are not identified if cognition is deemed to be the dominant contributor to the HFE. TABLE 10: SUMMARY OF POST INITIATOR HFE shows that there are numerous HFEs without execution analyses (unless these are intended to be cognitive only HFEs). HRA Calculator data file DB HRA POST 5-12-10 VER 4.1.1.HRA.	Recommendation: Identify high level tasks for HFEs without execution analyses (about 10), and for any new HFEs identified in HR-E1, HR-E2.	The following were included for each HFE in the HRA calculator: cues, timing, applicable procedures, initiators, and accident progression information. Added statements to HFEs (in the calculator database) if they are cognitive only. Post-initiator HEP reports are included in the HRA notebook, Appendix C.	IE resolution applies to the Fire PRA. All Fire HFEs were also developed in the HRA calculator, and documented in Attachment C of the Fire PRA notebook.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-G1 (HR-G1)	Gap NC	Observations: (1) No screening HEPs are used per Table 8 in the summary document.. (2) The HCR method is applied, which has been supplanted by the HCR/ORE methods.	Recommendation: Apply the HCR/ORE method instead of the HCR.	The HRA calculator was used for all HEPs. Detailed assessments were performed for most HEPs, including significant HEPs. Also, as described in the HRA notebook, the HRA Calculator implements HCR/ORE. Post-initiator HEP reports are included in the HRA notebook, Appendix C.	See HR-F2
HR-G2 (HR-G2)	No gap	Observation: No gaps. CBDT and HCR/ORE address both cognition and execution.	None provided.	As described in the HRA notebook, the HRA Calculator implements EPRI methods that include cognition and execution.	IE resolution applies to the Fire PRA; The Fire HFEs use the same methodology as the internal events HFEs, and both were developed in the HRA calculator.
HR-G3 (HR-G3)	No gap	Observation: No gaps identified.	None provided.	Performance shaping factors are addressed and included through use of the HRA Calculator.	IE resolution applies to the Fire PRA; also see HR-G2.
HR-G4 (HR-G4)	Gap NC	Observation: The system time windows are generally based on informal calculations.	Recommendation: (1) Determine success criteria and associated specifications for MAAP runs for all HFEs. (2) Use thermal hydraulic code such as MAAP for calculating system time windows and the time at which the relevant cues occur.	Each HFE was developed in the HRA calculator and documents the applicable time window. Time windows were generally based on the Sequence Analysis MAAP runs. Post-initiator HEP reports are included in the HRA notebook, Appendix C.	IE resolution applies to Fire PRA; Similar to the internal events HFEs, timing for Fire HFEs considered MAAP analysis. The Fire HFEs are documented in Attachment C of the Fire PRA HRA notebook, and include a time window and reference associated MAAP analysis (e.g., XHACLDTE).

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-G5 (HR-G5)	Gap NC	Observation: Significant HFEs are not identified as such. Some operator response times are estimated. See p.5 for type CP HFEs.	Recommendation: (1) Identify significant HFEs based on R.G. 1.200 criteria (2) determine if it is needed to do talk-throughs or simulator obs. for HFEs where such times estimated.	As discussed in the HRA notebook, operator interviews were conducted and simulator observations were observed to support the HRA analysis, including time to complete operator actions. In addition, the HRA update was performed by a PRA analysis that was a previously licensed SRO at DBNPS. A risk ranking of the HFEs was also reviewed for consistency and the top operator actions are included in the Quant notebook, Appendix N and on the risk posters displayed onsite.	See HR-G4
HR-G6 (HR-G6)	Gap NC	Observation: No explicit reasonableness check. Need to rank HFEs by HEP and check for consistency at least.	Recommendation: Perform reasonableness check.	As discussed in the HRA notebook, a review of the post-initiator HEPs was performed, including a review of probabilities relative to each other and similar actions, for scenario reasonableness, and dependencies. HEPs were also reviewed in the cutset reviews included in the Quantification and Level 2 notebooks.	IE resolution applies to Fire PRA; Similar to the internal events HFEs, a reasonableness review of the Fire PRA results was performed for relative HEPs, scenario context, operational practices and experience.
HR-G7 (HR-G7)	No gap	Observation: No gaps.	Recommendation: New dependency analysis can be performed using HRA Calculator.	As described in the HRA notebook (and Quantification notebook), the HRA Calculator was used to do the dependency analysis. Also, as documented in the HRA notebook, a detailed review of several combinations of HEPs was performed.	IE resolution applies to Fire PRA. As discussed in the Fire PRA HRA notebook and Fire Risk Quantification notebook, the HRA dependency analysis was updated to include the Fire HFEs.

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-G8 (HR-G9)	Gap NC	Observation: Uncertainty is expressed via error factors. Median HEPs are used.	Recommendation: Convert median HEPs to mean HEPs.	The HRA Calculator was used and uncertainty was characterized for each HEP. Post-initiator HEP reports are included in the HRA notebook, Appendix C.	IE resolution applies to the Fire PRA; All fire HFEs were also assessed using the HRA calculator and include uncertainty. Attachment C of the Fire HRA notebook shows the mean HEP value along with the Error Factor.
HR-H1 (HR-H1)	No gap	Observation: No gaps. See and p.6 and Table 10 in summary document.	None provided.	As documented in the HRA notebook, operator recovery actions are considered.	See HR-H2
HR-H2 (HR-H2)	Gap NC	Observation: The recovery action methodology does not consider manpower requirements.	Recommendation: Review 28 recovery actions to confirm adequacy of resources.	As described in the HRA notebook, manpower requirements were reviewed for recovery actions. These are documented in HRA Calculator, Manpower Requirements table. Recovery Action HEP reports are included in the HRA notebook, Appendix D.	IE resolution applies to Fire PRA. No new Fire recovery actions were considered.
HR-H3 (HR-H3)	No gap	Observation: No gaps. Recovery HFEs are included in HFE Combinations by inspection of Tables 9 and 12.	None provided.	As documented in the HRA notebook, operator recovery actions are considered.	See HR-H2

Table U-1 Internal Events PRA Facts and Observations

SR2009 (2005)[1]	Gap[2]	Assessment Comments	Resolution To Meet CCII	Resolution/How Gap Closed in PRA-DB1-AL-R05	Resolution/How Gap Closed in Fire PRA
HR-I1 (HR-I1)	Gap NC	Observation: Most of the pre-initiator analysis spreadsheets are missing. Only 3 pre-initiator analyses were found KHAFL12L, KHAFL11L, KHACCFLL in the provided spreadsheets. There are numerous versions of the same spreadsheets, and it is not clear which are the definitive spreadsheets that should reflect the current analysis. Recommend documenting the dependency analysis. Dependency analysis addressed in body of text and reference made back to Quantification Notebook.	Recommendation: Identify and properly reference all spreadsheets that are used in the HFE analyses. Alternatively, upgrade the HRA to the EPRI HRA Calculator platform.	As described in the HRA notebook, HEPs were calculated using the HRA Calculator version 4.21. All HEP reports are included as appendices to the HRA notebook. The HRA notebook, section 3, includes a detailed discussion of the HRA dependency analysis.	IE resolution applies to the Fire PRA. The Fire HFEs were also assessed using the HRA calculator.
HR-I2 (HR-I2)	Gap NC	Observation: If HCR/ORE method is implemented, need to update documentation to describe this method. If the HRA Calculator conversion is performed, need to update documentation to describe HRA Calculator approach.	None provided.	As described in HRA notebook, HEPs were calculated using the HRA Calculator version 4.21. The HRA notebook, Sections 2 and 3, include HRA Calculator methods; Section 3 identifies that the HRA Calculator supports the HCR/ORE method.	IE resolution applies to the Fire PRA. The Fire HFEs were also assessed using the HRA calculator.
HR-I3 (HR-I3)	Gap NC	Observation: Not documented explicitly.	Recommendation: Review analyses files and document key assumptions, if applicable.	Assumptions and uncertainties identified in HRA notebook Section 1. Also, the Quantification notebook (and Level 2 notebook) include a compilation of key sources of model uncertainties.	IE resolution applies to Fire PRA. Similarly, the Fire HFE HRA notebook identifies assumptions (section 5) and uncertainties (section 6).

1. The GAP Assessment was performed against RG 1.200, Revision 1 (and the 2005 ASME/ANS Standard); therefore, a cross reference to the current RG 1.200, Revision 2 (and the 2009 ASME/ANS Standard) was added.
2. Gap Significance: A = Significantly Non-conservative; B = Small Non-conservative; C = Conservative/Very Small; D = Documentation Only; and NC = Not Categorized.

Table U-2 Level 2 Facts & Observations

Focused Peer Review of DBNPS PRA LERF Oct 17 & 18, 2011

SecID (SR2009)	F&O Type	Assessment Comments	Resolution/Closed in PRA-DB1-AL-R05	Resolution/Closed in Fire PRA
LE-A3-01	Suggestion	There is a tacit assumption that the power status at the beginning of the core melt condition remains the same throughout the Level 2 sequence. This is reasonable for LERF as the time available for the early event progression and containment failure is often short. This is a conservative assumption and no action is required. However, there may be a benefit to considering recovery of offsite power for the late over-pressurization events. Possible Resolution: Consider adding recovery of offsite power for the late over-pressurization events.	As discussed in Section 2 of the Level 2 notebook, consideration will be given to recovering offsite power for late over-pressurization events.	Same resolution applies to the Fire PRA.

Table U-2 Level 2 Facts & Observations

Focused Peer Review of DBNPS PRA LERF Oct 17 & 18, 2011

SecID (SR2009)	F&O Type	Assessment Comments	Resolution/Closed in PRA-DB1-AL-R05	Resolution/Closed in Fire PRA
LE-C1-01	Finding (CC-I)	LERF contributors are based on definition 3 of NUREG/CR-6595, R1. This defines a large release as >10% I2 release from the containment to the environment. However, as a result of the code error identified in the MAAP FLASH and discussed in the Kick-off meeting (see Section 8.8), the justification process for the LERF rating appears to not currently be valid. As a consequence the current process does not meet the expectation of a category 2 process. The model issue is discussed in the report. Regardless, an evaluation using surrogate criteria, such as physically observable features of the transient, suggests that all existing LERF sequences would be captured by a simpler observable scheme similar to that used in NUREG/CR-6595. However, as a result of this ranking process, one class of events associated with small loss of CI events (Class 4.2) , may not be properly mapped as non-LERF. This has a small, but non-negligible impact on LERF ranking should these events be considered LERF. The actual event was analyzed conservatively and a more careful analysis would likely have the even remain as non-LERF. As a consequence the overall process is currently considered CAT 1. To improve this rating, a reanalysis using a corrected process should be performed. Possible Resolution: To meet CCII, DBNPS should re-perform the LERF mapping. This may be done by using MAAP 4.9.6 with masses versus isotopes (this should resolve the MAAP FLASH issue) OR by using an upgraded version of MAAP.	The MAAP 4.0.6 analysis has been updated using mass for core inventory (verses isotopes) and the Release Category grouping has been re-evaluated; RC 6.1 was moved from Large Early to Small Early, and RC 7.2 was moved from Small Late to Large Late. RC 4.2 remains a Small Early release, CsI is <2%. The updated MAAP analysis are documented in the Level 2 MAAP notebook, and the Source Term Category binning is discussed in Section 6 of the Level 2 notebook.	Same resolution applies to the Fire PRA.

Table U-2 Level 2 Facts & Observations

Focused Peer Review of DBNPS PRA LERF Oct 17 & 18, 2011

SecID (SR2009)	F&O Type	Assessment Comments	Resolution/Closed in PRA-DB1-AL-R05	Resolution/Closed in Fire PRA
LE-C3-01	Suggestion	No repair is credited, however, analyses were performed to confirm that no action was credible. Section 7.3 notes that each of the top risk significant LERF sequences was reviewed. It was concluded that "None of the sequences had failed equipment or human inability to perform actions due to the accident environment that would be altered by any engineering analyses, which addressed SR LE-C10". As no equipment repair was considered credible. Recovery of AC was also not considered. As time for power recovery to arrest core melt is very short (<1 hr) and evacuation times are small (less than 8 hours for GE) , recovery of AC is not considered important to the assignment of LERF sequences. Possible Resolution: It is recommended that additional discussion be added to highlight basis for not considering AC recovery.	See LE-A3. Also, as discussed in Section 2 of the Level 2 notebook, repair/recovery was not credited because the top LERF sequences did not include equipment or human actions that could be repaired/recovered/improved through engineering analysis.	Similarly, the top Fire LERF sequences did not include equipment or human actions that could be repaired/recovered/improved through engineering analysis.
LE-C6-01	Suggestion	Note that LE-C6 subsumes requirements from table 2.2-4. Table 2.2-4 SY-A22 notes that systems may be credited beyond design basis operation based on analyses. Judgment on system operation in beyond design basis environment was based on MAAP predictions for temperature and pressure containment conditions. It was noted that system operation will not be significantly beyond normal design basis conditions, although a clear documentation comparing the DB requirements and post DB environment was not provided.	Section 5.3 of the Level 2 notebook discusses consideration of equipment operation in a severe accident environment. As discussed, although the containment environment may be considered adverse, none of the equipment credited in the Level 2 analysis is expected to be challenged beyond its designed capability.	Same resolution applies to the Fire PRA.

Table U-2 Level 2 Facts & Observations

Focused Peer Review of DBNPS PRA LERF Oct 17 & 18, 2011

SecID (SR2009)	F&O Type	Assessment Comments	Resolution/Closed in PRA-DB1-AL-R05	Resolution/Closed in Fire PRA
LE-C7-01	Suggestion	No talk-through or operator interviews were noted in the documentation. Information provided by DB PRA staff indicated that the team that developed the SAMG HFEs included a previously licensed SRO. Additional discussions were performed with an active SRO fully knowledgeable in the SAMGs. This information was not documented in the Level 2 report. Possible Resolution: For the purposes of completeness, it is recommended that this information, if available be included in the formal project documentation.	As discussed in Section 3.1 of the Level 2 notebook, the PRA HRA analyst was a previously licensed SRO at DBNPS. Also as summarized in Section4 of the HRA notebook, additional discussions were performed with an active DBNPS SRO fully knowledgeable in the SAMGs.	Fire HRA performed by same PRA analyst with previous SRO license at DBNPS, and additional discussions conducted with the same active DBNPS SRO fully knowledgeable in the SAMGs. In addition, as documented in the Fire HRA notebook, feasibility was evaluated for all Fire HFEs.
LE-C13-01	Finding/Not Met	ISLOCA is not treated in a conservative manner as SOKC impact is neglected for ISLOCA sequences. Criteria for not considering impact were based on small CDF contribution. However, LERF contribution of impact was not negligible (it was small). The lack of treatment of SOKC indicates that the approach was not realistic. Possible Resolution: Solutions to remedy this issue were provided by the DB staff. This includes implementing the SOKC derived factors as multipliers and integrating into the baseline LERF contribution.	As discussed in Section 3.4 of Initiating Event notebook V3, for ISLOCAs Due to Failure of DN 11 and DH 12, UNCERT was run, and showed a negligible change in risk (for internal ruptures of redundant MOVs). Because the change in CDF is very small, and the increase in LERF is small, no change was made to the model. As discussed in the notebook, any application that uses an absolute change in LERF would not be impacted, but applications that use a percentage change could be impacted, even though the impact would be conservative. The notebook recommends adjusting for this correlation in applications addressing the internal rupture of MOVs DH11 and DH12.	N/A to the Fire PRA (this SOKC is associated with an internal ruptures of two MOV).

Table U-2 Level 2 Facts & Observations

Focused Peer Review of DBNPS PRA LERF Oct 17 & 18, 2011

SecID (SR2009)	F&O Type	Assessment Comments	Resolution/Closed in PRA-DB1-AL-R05	Resolution/Closed in Fire PRA
LE-D4-01	Suggestion	The analysis considered the conditional piping rupture potential given high pressure exposure but this was not properly documented. Possible Resolution: It is recommended that documentation regarding conditional piping rupture given high pressure exposure (in order to confirm failure of downstream piping) be improved.	Conditional piping rupture potential is considered and documented in several areas: in ISLOCAs, in the L2 from the L1 (Initiating event notebook V2); in ISGTRs where an assessment was made of the susceptibility of various portions of the RCS to creep rupture (Level 2 notebook Section 5.2.6); in Hot leg failures (Level 2 notebook Section 5.2.9); and in ECF and pressure generated piping as missiles (Level 2 notebook Section 5.2.13).	Same resolution applies to the Fire PRA.
LE-E4-01	Suggestion	As part of LE-E4 all of the QU elements must be satisfied. The circular Logic breaking (QU-B5) was not easily followed for the Level 1 logic. The logic breaking is identified in each individual system notebook with the discussion of top events. This makes it difficult to determine if circular logic breaking was addressed in an appropriate manner. Possible Resolution: Recommend that DBNPS group all circular logic into one location, or a separate notebook, so that traceability is easier to follow.	A discussion of circular logic is included in each system notebook.	Same resolution applies to the Fire PRA.
LE-F1-01	Suggestion	In-vessel recovery and RPV and/or containment venting is identified in Table 2-2.8-9 of the Standard as "LERF contributors to be considered." Neither of these elements are addressed as a significant LERF contributor in Table 7.2-5 of PRA-DB1-AL-R05. All other elements identified in Table 2-2.8-9 are addressed. Possible Resolution: Provide a table note or a few sentences explaining why these two items were not included.	The table is now included in the Quantification notebook (Table 5.2-1) and a foot note has been added that the contributors identified are those identified in Table 2.2.8-9 for large, dry, containment designs.	Same resolution applies to the Fire PRA

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations
Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFPP-B3-01	Finding	DOCUMENT sources of model uncertainty and related assumptions (as identified in QU-E1 and QU-E2) associated with the internal flood plant partitioning. Associated SRs (met): IFEV-B3, IFQU-B3, IFSO-B3 & IFSN-B3. Basis for Significance: The uncertainty analysis was performed on the failure rates and HRA values. There is an assumption section but not all the modeling assumptions are listed in the assumption section. Numerous key assumptions were discovered during conversations with the staff and were not documented in the flood analysis. This could lead to missing key assumption when doing the uncertainty analysis. Possible Resolution: Ensure that all assumptions are listed in the assumption section.	Documentation has been updated to identify all key assumptions in the applicable 'Assumption' section. For example, IFPRA Section 9.5 lists assumptions associated with the Flood Consequence Analysis; assumption 6 was added on plant trips; assumptions 8 & 9 were added on spray scenarios; assumption 10 was added on floor drainage; and assumption 11 was added on door failures. Section 12.4 discusses uncertainty.	The Fire Uncertainty and Sensitivity Analysis notebook characterizes uncertainties throughout the Fire PRA; it includes parameter or model uncertainties, and assumptions in the model. The Fire Peer Review gave the Fire PRA Uncertainty Notebook a Best Practice – noting that it contained a comprehensive list of assumptions, meaningful sensitivities, and distributions for CDF and LERF.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations

Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSO-A1-01	Finding SR not met	The available documentation does not present a complete listing of flooding sources as per the supporting requirement and the basis for exclusion is not presented. Associated SRs: IFSO-A4 & IFSO-B2. Basis for Significance: The SR indicates that equipment connected to fluid systems shall be identified. This includes pumps, gaskets, valves, etc. It is not possible to ensure that the identified assessment is bounding with regard to the sources. Possible Resolution: There are several approaches. One is to add the components into the flood zones. An alternative approach is to document the assumptions related to why the piping is a controlling failure mode and then provide a select sensitivity basis to show that this is the case.	Documented in Section 4.1 that this analysis follows the EPRI methodology (Ref. 4-2) which recommends use of the EPRI failure frequency report (Ref. 4-1) for pipe failure data. This report lumps together many types of fluid containing components (tanks, pump and valve casings, fittings, valve stems, etc.) and averages their frequency with piping failure rates, so it embeds failures of all piping system components as part of the piping segment failures averaged on a per linear foot basis. This approach is justified by the observation from service experience that shows that almost all piping system failures occur in pipes or at welds between pipes and components and the fact that the few non-pipe failures have in fact been included in the collected failure data (Ref. 4.2, Section A.2). Thus, all potential sources of flooding (piping, valves, pumps, tanks, etc.) were included in the analysis (IFSO-A1) as feet of piping. I.e., a six-foot long pump would be treated as a six-foot section of piping having the characteristics of the outlet (higher pressure) piping. The flooding mechanisms that could result (e.g., failures of pipes, tanks, gaskets, fittings, seals, etc.) were thus included as failure (spray, flood, major flood) of the associated system pipe length (IFSO-A4). All pressure boundary failures have been covered, including failures in pipe base metal, welds, and other metallic pressure boundary components such as valve and pump bodies, heat exchangers, and fittings. This assumption was added to Section 4.2.	Documentation of flooding sources is N/A to the Fire PRA. However, C-FP-013.10-008, Fire Ignition Frequencies, identifies DBNPS ignition sources, and includes information on Transients, cable loading and plant fire event data. In addition, in response to Fire Peer Review F&O IGN-A1-01, additional sites were reviewed to ensure a complete listing of ignition source component types were considered for DBNPS.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations

Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSO-A1-02	Finding SR not met	For the rooms selected for the peer walkdown the selection of sources appeared to be complete. However, the peer review walkdown did identify that the current documentation appears to have missed the presence of portable eyewash stations in battery rooms. Basis for Significance: The supporting requirement requires the identification and the assessment of all flooding sources. This item (i.e. eyewash station) was missed and was associated with an important electrical room so it should be added. Possible Resolution: This source is not considered to be significant, but should be included in the documentation and assessed. Particularly since other studies have found more permanent stations as somewhat important.	Re-performed a walkdown of the battery rooms. Each battery room (Room 428A and Room 429B) has an self-contained eyewash station, which can hold approximately 10 gallons of water. Therefore, this is not a flooding concern. The eyewash station is configured with an FME bag over the top of it so a random activation would not result in spray. Although the pressure in the eyewash station is approximately 80-90 psig, each of the nozzles is equipped with a foam insert to reduce the flow from a forceful spray to a gentler flow. Per discussions with the Maintenance Services Supervisor and personnel who maintain these stations, the water only flows out of the nozzles a couple of feet. The eyewash stations are approximately six feet from the batteries. During emergency use of the station, any incidental water that may splash onto the batteries would not build up to a level that would short between the battery terminals. Therefore, the stations are not considered a spray source. Discussion of the eyewash stations was added to Section 4.0 and Table 4-1, as well as to Table D-1. Pictures of the eyewash stations have been added to the walkdown documentation (Appendix C.2). Also, as discussed in Section 6, flood sources can be screened if the flood source in insufficient to cause failure of accident initiation/mitigation equipment.	Flooding walkdown documentation is N/A to the Fire PRA. However, Fire walkdowns were performed separately from the flooding walkdowns, and included forms/documentation and pictures. See also LAR Attachment V, Fire Peer Review F&O PP-C3-01.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations
Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSO-A3-01	Finding	No screening was performed on any fluid piping system but this was not documented. Basis for Significance: Due to the fact that an F&O was written for the lack of identification of potential flood source, IFSO-A1-01, this F&O is written to ensure that when IFSO-A1-01 is resolved that no newly identified sources will be incorrectly screened. Possible Resolution: Provide documentation that no flood areas with potential sources were screened out.	F&O IFSO-A1-01 was resolved by documenting the flood sources listed include all fluid containing components (including pumps, gaskets, valves, etc.), so no newly identified sources were incorrectly screened. Qualitative screening was performed only for those areas where no flood sources existed (IFSO-A3), or the fluid sources were so minor that failure would not cause an initiating event or need for an immediate plant shutdown, and the associated flood area contains no accident initiation/mitigation equipment susceptible to flood damage (IFSN-A12). Section 6 has been re-worded to more clearly state that no flood areas with potential flood or spray sources were screened out.	Documentation of flood source screening is N/A to the Fire PRA.
IFSO-A5-01	Suggestion	For each source and its identified failure mechanism, IDENTIFY the characteristic of release and the capacity of the source. INCLUDE: (a) A characterization of the breach, including type (e.g., leak, rupture, spray) (b) Flow rate. Basis for Significance: It is stated that for expansion joints the flow from a rupture was 1/2 or 1/4 of the flow area. This assumption was not used. Possible Resolution: Remove this assumption from the notebook.	The assumption was modified to state that the entire flow area would conservatively be used. References to 1/2 or 1/4 of the flow area were removed.	The flow area used in characterizing floods is N/A to the Fire PRA.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations

Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSN-A1-01	Finding	For each defined flood area and each flood source, IDENTIFY the propagation path from the flood source area to its area of accumulation. Basis for Significance: Rooms with two doors only propagated the path for one door failing open. Although an analysis may have been performed that indicated the consequences of propagating the flood via the other door (or both doors simultaneously) would be less significant, such an analysis was not included in the documentation. This means not all propagation paths have been documented. When the flood model is used in the risk monitoring program, the propagation path(s) not documented may become significant depending on what equipment is taken out of service. Possible Resolution: Re-analyze, if necessary, and document the analysis of the other door failing first and of both doors failing simultaneously. If the analysis allows screening of these propagation paths then do so. If the analysis does not allow screening of these propagation paths then include these propagation paths as scenarios in the flooding model. Document the results of the screening.	The room in question was the Cable Spread Room (Room 422A), flood area DD-01-A. The room has two doors that open outward and thus have an equal probability of failing open during a large (9000 gpm) flood from the Fire Protection piping in the room. This finding was resolved by using split fractions for the potential failures of the doors: 0.45 for failure of one door; 0.45 for failure of the other door; and 0.10 for failure of both doors. Scenarios that include all of these possibilities (all propagation paths) are included in the documentation. An assumption was included in Section 9 stating that when more than one outward-opening door could fail to propagate a flood, the door whose failure would cause the highest CCDP is conservatively assumed. Thus, the analysis is bounding.	The number of flood-induced door failures in each flood area is N/A to the Fire PRA. However, a Best Practice was identified in the Fire Peer Review for SR FSS-H8-01 - the use of electronic plant information for identifying barriers and automating the process of calculating barrier failure probabilities is recognized as a robust approach for supporting the multi-compartment analysis.
IFSN-A4-01	Superior	Calculator used for capacity of drains and amount of water retained and impact on SSCs. Basis for Significance: Makes process easy to follow and documents inputs and outputs from Calculator. Exceeds expectations of SR.	None required - superior	Calculations associated with the Flood Height Calculator are N/A to Fire PRA.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations

Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSN-A6-01	Finding	Flood scenarios are provided for the loss of control room HVAC. However, the potential consequence of having a loss of main control room cooling leading to a need to abandon the control room or take compensatory measures is not considered and no heat up analysis is provided. Basis for Significance: Recent studies at other facilities have identified the potential for a loss of MCR HVAC to progress to a need to abandon the control room due to overheating of equipment. Continued operation is challenged by such events and should be considered. This is also true for any other flooding zone that may lead to similar consequences either directly or indirectly due to a loss of control room HVAC. Possible Resolution: Determine the possibility for a need to include the postulated failure mode and the associated plant response either through the use of compensatory actions or the abandonment process.	The Control Room is served by a normal HVAC system, with backup by the Control Room Emergency Ventilation System (CREVS). As described below (and in the Initiating Event Notebook Vol. 1, Section 1.2.2.7.1), in the event there is insufficient Control Room cooling, procedures describe steps to reduce the heat load and, when necessary, perform a plant shutdown. DB-OP-02533, "Control Room Emergency Ventilation System Load Shedding," directs operators to de-energize selected Control Room and Control Room Cabinet Room electrical loads in an effort to maintain Control Room Cabinet Room temperatures within design limits. If the Control Room Cabinet Room Temperature reaches 105°F, Operators are directed to perform a plant shutdown. If the Control Room Cabinet Room Temperature reaches 110°F, operators are directed to trip the reactor. NOP-ER-3202, "Control Room Envelope Habitability (CREHAB) Program," ensures adequate controls are verified to be in place so operators maintain the ability to safely shut down the plant from the Control Room. The CREHAB program ensures Control Room Envelope (CRE) integrity is maintained and the CRE remains habitable to allow operators to control the reactor safely under normal conditions, and maintain the reactor in a safe condition following a radiological event, hazardous chemical release, or a smoke challenge. Technical Specification 3.7.10, "Control Room Emergency Ventilation System (CREVS)," requires being in Mode 5 within 36 hours following the loss of both trains of CREVS. There is no guidance to abandon the Control Room based on temperature.	As described in C-FP-013.10-35, Main Control Room Analysis, the Fire PRA model explicitly considered the probability of Control Room abandonment (including those due to habitability and adverse environmental conditions).

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations

Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSN-A6-01 (Continued)			There are two procedures that direct leaving the Control Room. The first, DB-OP-02519, "Serious Control Room Fire," directs Operators to trip the reactor as the first Immediate Action. The second, DB-OP-02508, "Control Room Evacuation," only identifies one symptom - Any event or condition other than a serious Control Room fire that would be life-threatening if personnel remain in the Control Room; it also directs Operators to trip the reactor as the first Immediate Action. It is unimaginable that temperatures in the Control Room could reach life threatening levels due to a loss of ventilation. Temperature reducing options such as load shedding, stay times, ice vests, opening doors, and using fans to provide fresh air to the Control Room would be implemented until the plant was shutdown. Therefore, based on system redundancy, the presence of operators to detect and correct an abnormal situation almost immediately, and procedure direction to perform a plant shut down/trip the reactor, the loss of HVAC to the Control Room was not considered as a separate initiating event, and neither the normal Control Room HVAC or CREVS were modeled in the PRA, or flooding analysis. There would be no impact on CDF or LERF because the plant would be shutdown before Control Room temperatures reached the point where equipment operation would be affected. Note that flooding scenarios in the Control Room area (HH-01-A) are modeled; however, they are not risk-significant (total CDF of all combined floods and spray scenarios in HH-01-A is 8.73E-10).	

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations
Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSN-A9-01	Finding	PERFORM any necessary engineering calculations for flood rate, time to reach susceptible equipment, and the structural capacity of SSCs in accordance with the applicable requirements described in Section 2-2.3. Basis for Significance: In the calculation of door openings and closing, the calculation is wrong. The equation was re-calculated and the values do not match the values in the documentation. Possible Resolution: Correct the calculation.	Corrected the calculation for door-hours in Table 7-4. The error resulted in a minor change in door failure probability and did not change the conclusion that such failures could be screened.	Flood rate calculations are N/A to the Fire PRA. However, the Fire PRA Peer Review gave a CC III rating to SR FSS-C5-01 for implementing damage criteria for temperature sensitive electronics.
IFSN-A9-02	Suggestion	PERFORM any necessary engineering calculations for flood rate, time to reach susceptible equipment, and the structural capacity of SSCs in accordance with the applicable requirements described in Section 2-2.3. Basis for Significance: Explain the calculation used to produce the frequency that the doors were open. Possible Resolution: Document the equation used for producing the frequency of the doors being open.	Included the equation for calculating door hours and failure probabilities in Table 7-4.	Flood rate calculations are N/A to the Fire PRA.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations

Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSN-A9-03	Finding	PERFORM any necessary engineering calculations for flood rate, time to reach susceptible equipment, and the structural capacity of SSCs in accordance with the applicable requirements described in Section 2-2.3. Basis for Significance: The time allotted for discover and mitigation of a flood does not have a documented basis. Possible Resolution: Document the basis for the time allotted for discover and mitigation of floods.	Re-worded Section 11, Assumption 7.7.11 to say, "Per discussions with Operations personnel, based on the various personnel active in the plant (Operator and Security rounds, hourly fire watches, maintenance and chemistry activities) and plant indications and responses to such floods (e.g., sump alarms, annunciators), it is not considered credible that identification and successful flood mitigation is not completed within 120 minutes."	Documented basis for flood mitigation within 120min is N/A for Fire PRA. However, Fire HRA notebook documents the feasibility of fire human actions, including the NUREG-1921 basis that fire events are under control after an hour.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations
Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSN-A10-1	Finding	It is inconclusive with regard to the qualitative selection process used to define the initial bounding CCDP (consequential faults) for flood zones not assessed in detail but rather a grouped flooding event and bounding consequences. It is not clear that what was used as attributes utilized. It is clear that those predicted to be most important were examined in more detail on a source by source basis, but if the bounding consequential faults were not selected appropriately the rank order may be inappropriate and an important contribution could have been missed. Without process documentation and documentation of selection criteria this cannot be resolved. Basis for Significance: The standard specifically indicates that the assessment will be performed for "For each defined flood area and each flood source". This is required since the flood has profound effects on response, multiple components, etc. and it is flood specific. The approach taken is not in full compliance but may be acceptable if the selection for CCDP is bounding. Assurance of this is not provided since the process and the assessment is not documented. Possible Resolution: There are two options for resolution. The first is to extend the assessment to split all piping into individual scenarios which would fully meet the supporting requirement. An alternative would be to provide the basis for the selection in the documentation (process) and then provide a table documenting the implementation of that process to the various flood zones.	As shown in Appendix E, Table E-2, whole area scenarios have been sub-divided into multiple scenarios based on individual system piping. For example, a scenario that included failure of Component Cooling Water (CCW) piping (with both trains of CCW present) was divided into two different scenarios: one for failure from CCW Train 1 piping, and one for failure from CCW Train 2 piping;. likewise for Service Water piping. Similarly, spray scenarios initially developed assuming failure of all SSCs have been divided into sub-areas (groups) and consider equipment affected within 10 feet.	IFPRA flood area and source grouping for bounding CCDP estimates is N/A to the Fire PRA. However, as discussed in the Fire Risk Quantification notebook, 44 of the 78 compartments required detailed fire modeling; 34 were found to have acceptable risk based on full compartment burns.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations
Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFSN-A16-01	Finding SR met at CCIII	Needs documentation to verify that operator actions were not used for screening. Basis for Significance: There is evidence that operator actions were not used to screen out flood sources. There is no documentation to support this. To ensure that this is indeed true, documentation stating that no operator actions were used to screen out flood sources is required. Since an in depth review would be require to verify this, a finding has been used to ensure the documentation will be added. Possible Resolution: Provide documentation that no operator actions were used to screen out flood sources.	Section 6 was re-worded to document that no flood areas or flood sources were screened based on reliance on operator actions, thus meeting CCIII for IFSN-A14 and IFSN-A16.	Documentation that operator actions were not used to screen flood areas or sources is N/A to the Fire PRA.
IFSN-A17-01	Suggestion	Tables A-1 through A-4 document mitigative features as "Yes". Would be useful to document what the mitigative feature is. Basis for Significance: Meets requirements of category. Possible Resolution: Instead of "Yes" in mitigative features column of Tables A-1 through A-4, put the mitigative feature in the column such as "Spray Shield".	Table A-1 has been updated and the mitigative feature has been identified; all those previously listed as yes were spray protected and the table now identifies them as spray protected.	Identification of spray protection mitigative features is N/A to the Fire PRA.
IFSN-B1-01	Suggestion	Documentation requirements for the standard are met. Could be made easier to use in three cases. Basis for Significance: Requirements met. Ease of use could be enhanced in a few areas. Possible Resolution: 1) Add table which lists the automatic isolation of CCW, Domestic Water and automatic trip of Circ Water pumps. 2) Add a table which lists all the watertight doors with their door numbers and rooms they are separating. 3) Add HEP basic event name instead of HEP probability to Table G-1.	1) Automatic isolation table not required. Section 4 and Table 4-1 were revised to clarify the automatic isolation of CCW and the automatic trip of the Circulating Water Pumps. The discussion about the automatic isolation of Domestic Water was revised to clarify this automatic function is not modeled as a method of mitigating flooding. 2) Table E-1A revised to indicate which doors are watertight doors and the flood areas they are separating. 3) Table G-1 revised to include HEP basic event name.	Suggested documentation enhancements are N/A to the Fire PRA.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations

Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFEV-A6-01	Finding	GATHER plant-specific information on plant design, operating practices, and conditions that may impact flood likelihood (i.e., material condition of fluid systems, experience with water hammer, and maintenance-induced floods). In determining the flood-initiating event frequencies for flood scenario groups, USE a combination of: (a) Generic and plant-specific operating experience; (b) Pipe, component, and tank rupture failure rates from generic data sources and plant-specific experience; and (c) Engineering judgment for consideration of the plant-specific information collected. Basis for Significance: Davis-Besse does not have sufficient data for performance of a bayesian update. Therefore DBNPS generic data should be used. Possible Resolution: Use the generic values noting that plant data is not large enough to affect the overall initiating frequency. Ensure that plant events are noted and documented in the appropriate notebook.	Flooding frequencies have been updated; Bayesian updating using DBNPS data has been removed and frequencies are based on generic data (see IFPRA section 8).	N/A to the Fire PRA. However, as discussed in the Fire PRA Quantification notebook, fire frequencies were based on EPRI data, and a sensitivity was performed using NUREG/CR-6850 data – no Bayesian updating was performed.

Table U-3 Internal Flooding PRA (IFPRA) Facts & Observations

Peer Review of DBNPS PRA LERF Jul 18-20, 2012

SecID (SR2009)	F&O Type	Assessment Comments	Resolution	Resolution/Closed in Fire PRA
IFQU-A9-01	Suggestion	INCLUDE, in the quantification, both the direct effects of the flood (e.g., loss of cooling from a service water train due to an associated pipe rupture) and indirect effects such as submergence, jet impingement, and pipe whip, as applicable. Basis for Significance: Jet impingement and pipe whip were not addressed in the quantification. Due to the congestion of components in the plant and numerous design features to address HELB, it appears necessary that HELB be address to capture the flood risk insights. Possible Resolution: Address jet impingement and pipe whip in the model.	IFSN-A6 only requires submergence and spray effects for Capability Category I/II, as long as it is noted that the other mechanisms (jet impingement, pipe whip, humidity, condensation, temperature concerns, and any other identified failure modes) are not included in the scope of the evaluation. The exclusion of those failure mechanisms is noted in Section 7.2. IFQU-A9 says to include both the direct effects of the flood and indirect effects such as submergence, jet impingement, and pipe whip, AS APPLICABLE. This means that if jet impingement and pipe whip were included in IFSN-A6, then they must be included in the quantification in IFQU-A9. For this analysis, they were not included in IFSN-A6, so they are NOT APPLICABLE for IFQU-A9.	Jet impingement and pipe whip are N/A to the Fire PRA. However, quantification of Fire risk includes both direct effects (e.g., pump, cable, cabinet), as well as indirect effects (e.g., components within the zone of influence, multi-compartment analysis).

V. Fire PRA Quality

35 Pages Attached

V.1 Overview

The Davis-Besse Nuclear Power Station (DBNPS) Fire Probabilistic Risk Assessment (FPRA) is adequate to support the NFPA 805 Licensing Basis. A Peer Review of the DBNPS FPRA was performed by the PWR Owners Group (LTR-RAM-13-09) in June 2013. The review was performed against the requirements of ASME/ANS RA-Sa-2009, Part 4, including Clarifications and Qualifications provided in the NRC endorsement of the Standard contained in Revision 2 to RG 1.200. The peer review was performed using the process defined in Nuclear Energy Institute (NEI) 07-12, Revision 1.

The ASME Requirements for Fires at Power contain 183 Supporting Requirements (SR) under 13 technical elements. The following summarizes the results of the Peer Review:

- 24 SRs were determined to be not applicable to the DBNPS Fire PRA
- 141 SRs met CC II or higher
- 3 SRs were met at CC I
- 15 SRs were assessed as “Not Met”

In addition, 50 F&Os were generated during the review including 35 “Findings,” 13 “Suggestions,” and 2 “Best Practices.” Resolution of the DBNPS Fire PRA F&Os is discussed in Table V-1.

The impacts of the SRs that were met only at the Capability Category I requirement are listed in Table V-2, along with the resolution and associated F&Os. The impacts of the SRs that were identified as not met (listed below) were resolved through the following associated findings (discussed in Table V-1):

1. PP-C2: PP-A1-01
2. PP-C3: PP-C3-01
3. ES-A4: PRM-B10-01
4. ES-B3: PRM-B10-01
5. ES-B5: PRM-B10-01
6. CS-A9: CS-A2-01
7. CS-C1: CS-A2-01
8. CS-C4: CS-B1-01 & CS-B1-02
9. PRM-B2: PRM-B2-01
10. PRM-B10: PRM-B10-01
11. FSS-C7: FSS-C7-01
12. FSS-C8: FSS-C8-01
13. FSS-G4: FSS-G4-01
14. IGN-A5: IGN-A5-01
15. IGN-B3: IGN-B1-01

V.2 Unreviewed Analysis Methods

The DBNPS Fire PRA did not use unreviewed analysis methods.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
PP – Plant Partitioning				
PP-A1-01	Finding	Assessed to meet CC I-III	The global plant analysis boundary from Attachment 3 of C-FP-013-10-007 appears to include the entire plant site, with exclusions from the GPAB based on Attachment 1, Table B. This method is not consistent with NUREG/ CR-6850, which would include the Plant Protected Area (PPA) + areas with plant equipment (e.g., Intake Structure and Switchyard). Some of the plant areas in Table B can be excluded from the GPAB. However, those areas inside the PPA should be retained and screened through the Qualitative Screening (QLS) process, which would screen the area based on no Probabilistic Safety Analysis (PSA) components and no reactor scram, but would also retain the area for Multi-Compartment Analysis (MCA). Retain those areas inside the PPA through the QLS task and screen using NUREG/CR-6850.	Instead of starting with the entire plant site, the Global Plant Analysis Boundary (GPAB) will start with the Plant Protected Area. The GPAB plant drawing in Attachment 3 was replaced to limit the plant drawing to only the Plant Protected Area. The areas included in the GPAB are listed in Attachment 1, Table A of C-FP-013.10-007, and it identifies fire compartments associated with each area included in the GPAB. Attachment 1, Table B is retained in C-FP-013.10-007 as documentation of the review as required by NUREG/CR-6850, Section 1.5.4. This is a documentation enhancement. The compartments that were considered screened are generally free-standing and are open to the atmosphere, so there is no impact on the Multi-Compartment Analysis; there is no impact to the PRA quantification.
PP-C3-01	Finding	Assessed to meet CC I-III	The Plant Partitioning document (C-FP-013.10-007) provides the general guidelines for partitioning, which are consistent with NUREG/CR-6850. However, the document does not provide the justifications for selecting the barriers for the individual Plant Analysis Units (PAUs). Without identifying how the barriers are justified, elements like spatial separation or active fire barriers are not called out for future revisions. Plant personnel provided draft information and pictures that verify the barriers chosen for each room. The pictures provided verify the walkdowns performed and are also needed to satisfy PP-B7. The information to justify barriers is not in the current document and appears to be draft. Document the justification for the barriers chosen for plant partitioning.	As recommended by the peer review team C-FP-013.10-007, Attachment 4, was added to include ARS-DB-13-074, Substantial Barrier Qualification, in which Attachment 4a provides a complete list of barriers between fire compartments. Section 4 describes the methodology, including justification of fire barriers (e.g., Appendix R fire-rated, concrete barriers exceed thickness for 3-hr barrier, etc.). Section 6 identifies the barriers that required further analysis (i.e., fire protection drawings did not provide minimum required rating) and why they are acceptable (e.g., seals around the penetrations, no hot gas layer, etc.). This is a documentation enhancement, and there is no impact to the PRA quantification.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
ES – Equipment Selection				
ES-A1-01	Finding	Assessed to meet CC I-III	The selection criteria indicates, "Equipment (component, wire, cable, instrument, etc.) which if fire damaged, can lead to an initiating event or a consequential event after reactor trip that is modeled in the internal events "Probabilistic Risk Assessment (PRA)." This does not seem to address the potential that a failure may cause an indirect reactor trip due to Limiting Conditions of Operation (LCO) or other operational processes that would require a shutdown. Events that could result in a reactor trip due to administrative reasons in a PAU may have been excluded. Review operational system requirements on plant LCOs to ensure the current assessment is complete.	As recommended by the peer review team, Section 1 (Subtask 1) of the Fire PRA Component Selection Notebook 10-01 includes a review of equipment failures for possible initiators. Automatic and manual trips were reviewed for equipment failures caused by an initiating fire, including spurious operation. The detailed review is included in the Fire PRA Component Selection Notebook 10-01, Attachment B. This detailed review includes a compartment-by-compartment review of the equipment/cables impacted, and the initiator modeled is sufficient. In addition, the attachment also reviews LCO Section 3 for any additional potential for manual shutdowns due to equipment failures. The result of this finding is a documentation enhancement only; the current assessment appeared complete, and no new initiators were identified.
ES-A2-01	Suggestion	Assessed to meet CC I-III	REVIEW power supply, interlock circuits, instrumentation, and support system dependencies and IDENTIFY additional equipment whose fire-induced failure, including spurious actuation, could adversely affect any of the equipment identified per Supporting Requirement (SR) ES-A1. The review was done in the NFPA 805 Safe Shutdown Analysis Interim Transition Report, which is not referenced in the Component Selection Notebook. Reference the NFPA 805 Safe Shutdown Analysis Interim Transition Report in the Equipment Selection Notebook. Document the review to show that ES A2 has been met.	As recommended by the peer review, a statement was added to Section 1 (Subtask 1) of the Fire PRA Component Selection Notebook 10-01 that points the reader to the Nuclear Safety Capability Assessment (NSCA). The NSCA includes a review of the power supply, interlock circuits, instrumentation, and support system dependencies. As a result of this suggestion, 10-01 was updated to include a reference to where the work was already completed. Therefore, this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
ES-A3-01	Finding	Assessed to meet CC I-III	The assessment does not provide a direct relationship between the fire impacts and the mapping to the internal events modeling. Although it is believed that in the DBNPS internal events modeling, and in particular the transient event tree modeling, there is no direct demonstration that the selection of the transient event tree adequately models the specifics of the fire-induced initiating event. The fire scenarios are mapped to the transient event tree and reactor trip initiating event. This causes an inherent assumption that the fault tree modeling is sufficient to capture mapped impacts for systems and that timing is compatible with a reactor trip. Given that secondary normal Primary Coolant System (PCS) is failed by the un-located (UNL) logic, this conclusion needs to be confirmed because the UNL would be a loss of feedwater event. Although the component selection includes an assessment (Attachment G), this is a separate effects analysis and does not address, for example, multiple possible initiating events caused by a PAU fire where multiple systems can be impacted. This mapping is necessary to confirm the global mapping to reactor trip. Develop a table for the Plant Response Model (PRM) where the PAUs are assessed with regard to impacts and mapping to a specific initiator, along with comments as to why the selection is appropriate.	As recommended by the peer review team, Section 1 (Subtask 1) of the Fire PRA Component Selection Notebook 10-01 was updated to include a review of the equipment failures in each fire area for possible initiators, including spurious operation. For each fire area, equipment failures were reviewed and an assessment was made; this is included in the notebook as Table 2 of Attachment B. As a result of this finding, a general plant transient due to Loss of Main Feedwater and Instrument Air was concluded to be the limiting case. Therefore, this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
CS – Cable Selection and Location				
CS-A2-01	Finding	Assessed to meet CC I-III	The number of spurious operations/cables involved could not be readily discerned from the methodology in the Fire Hazard Analysis Report (FHAR), Revision 25, Section 3.8, which served as the input for cable selection and detailed circuit analysis for the Fire PRA. There is an assumption in Calculation C-FP-013.10-020, Revision 0 (Section 3.7), that the cable selection and location methodology was performed as described in NEI 00-01, Revision 2. However, this assumption has yet to be confirmed, is a Project Open Item DB-0786, and is referenced in C-FP-013.10-018 Fire PRA Cable Selection, Assumption 3.9. Cable selection methodology and scope serves as the basis for circuit failure probability and the scope of fire scenario targets. Complete review of NEI 00-01, Revision 2, and ensure the requirements of the CS SRs are met for the existing cable selection that was used as input for the Fire PRA. Update the Fire PRA as necessary if additional cables need to be addressed in the Fire PRA.	As discussed in C-FP-013.10-020, Detailed Circuit Failure Analysis, the potential response of circuits and equipment to specific cable failure modes associated with fire-induced cable damage were identified. The number of spurious operations/cables involved can be found in Attachment A, including the identification of all cables analyzed. For example, there are 4 cables identified for MS5889A (Steam admission valve to Auxiliary Feed Pump Turbine (AFPT) 1 in A-05) that were analyzed for spurious operation. As discussed in C-FP-013.10-018, NFPA 805 Safe Shutdown, Non-Power Operation, and Fire PRA Cable Selection Calculation, the identification and location of cables considered those identified for safe shutdown analysis (SSA) components evaluated in the FHAR, and those for non-SSA components that were added (e.g., from the Fire PRA Component Selection task). As described in FHAR, Rev 25, for each component on the Safe Shutdown Component List (SSCL), the Elementary Wiring Diagram was reviewed, and all circuit cables that ensure operability of the component were identified. Circuits not required for Safe Shutdown include annunciator, computer, motor heater, and external monitoring. The physical cable routings for power, control, and instrumentation were identified by reviewing Electrical Circuit Schedules and Electrical Raceway Schedules. The cable routing information was used to trace the cables. This culminated in a database that identifies all raceway routings for all circuits associated with Safe Shutdown components. As documented in ARS-DB-11-007, Revision 6, “Nuclear Safety Capability Assessment Methodology Review (Table B-2),” the methodology for cable selection and cable location data associated with cables credited in Appendix R (FHAR, Revision 25) has been verified against NEI 00-01, Revision 2, and found to align or align-with-intent.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
CS-A7-01	Suggestion	Assessed to meet CC I-III	There is no definition or delineation of potentially high-consequence equipment in the equipment selection Notebook 10-01, Fire PRA Component Selection. Cable selection calculation C-FP-013.10-018, Fire PRA Cable Selection, Assumption 3.6, states that there are no additional "potentially high-consequence equipment" in the Fire PRA model other than those previously identified as high-low pressure interface equipment under Appendix R." The high/low pressure interface components identified in Section 3.8 do not align with the definition of potentially high-consequence in NUREG/CR-6850 and the SRs CS-A6 and CS-A7. There does not appear a model vulnerability to this topic. It is a documentation issue to support clarity and future updates. There is a project open item DB-0783 related to this topic. Clearly identify high-consequence equipment in the equipment selection task. Suggest including a clear definition based on the guidance in NUREG/CR-6850, CS-A6, and CS-A7 in the equipment selection notebook.	As recommended by the peer review team, a discussion of high-consequence equipment has been added to Subtask 4 of the Fire PRA Component Selection Notebook 10-01. The definition from NUREG/CR-6850 is also provided. There are no PRA component failures in conjunction with a spurious operation of a single piece of equipment that might lead to an interfacing system LOCA or containment bypass that results in core damage and large early release, or loss of a single safety function that would lead directly to core damage. As result of this suggestion, an update to the 10-01 Fire PRA Component Selection notebook was performed to include the definition of high-consequence equipment. No equipment was identified as high-consequence equipment; therefore, this is a documentation enhancement only.
CS-B1-01	Finding	Assessed to meet CC II-III	Protective device coordination for power supplies relied upon in the Fire PRA, which were not previously addressed in the FHAR, has not yet been demonstrated. Studies were underway at the time of the peer review. This is documented as Open Item DB-0784 (Action Item 2) and is referenced in C-FP-013.10-018, Fire PRA Cable Selection, Revision 0, Assumption 3.7. Complete the coordination studies. For miscoordination, ensure the effects are modeled in the Fire PRA (e.g., model load cables affecting upstream power supplies or perform a modification to ensure coordination).	Same as CS-B1-02.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
CS-B1-02	Finding	Assessed to meet CC II-III	Coordination for safe shutdown power supplies, which was used as input to the Fire PRA, is documented in Section 5.1 and Appendixes C-2 and C-3 of the FHAR. The adequacy of the referenced evaluations in the FHAR to meet the Fire PRA Standard has not been determined. This is documented as Open Item DB-0784 (Action Item 1) and is referenced in C-FP-013.10-018, Fire PRA Cable Selection, Revision 0, Assumption 3.7. Some of the previously analyzed power supplies in the FHAR seem to not be properly coordinated, and they have been evaluated using "fire area-specific" resolution strategies based on load cable routing and deterministically credited success paths. These strategies do not appear to have been addressed in the Fire PRA. Examples include: 1. In the FHAR, notes for Appendix C-3, Item 22, "A review of coordination of the loads on MCC F71 has shown that one non-Safe Shutdown Load, Y3401 (50-amps) may not coordinate with the incoming 600-amp molded-case circuit breaker. This MCC is needed only for fire in Area EE (Aux Bldg. Fan Alley) and Y3401 serves loads in the Turbine Building, therefore, these are not associated circuits of concern." This is also similar to Item 27. This approach does not appear to be accounted for in the Fire PRA. 2. FHAR, Appendix C-3, Item 24, shows YE2/YF2 are conservatively failed. These buses do not appear to be always failed in the Fire PRA. Also, coordination for YE1/YF1 relies on cable length, which does not appear to be modeled in the Fire PRA. 3. FHAR, Appendix C-3, Note 21, appears to be a fire area-specific credit for lack of coordination. Protective device coordination is assumed in the Fire PRA, and that assumption needs to be demonstrated to ensure the appropriate fire scenario impacts are evaluated.	There are numerous calculations that address coordination. The calculations associated with FHAR loads are listed in Section 2.6 of the FHAR. FHAR Note 22 was resolved by adding the following cable to the SAFE Cable Logic as ASSOCIATED cable and was accounted for in the Level 1 Failure Reports and PRA: Power Supply BF71 & Cables BPBF7117A, BPBF7117B, and BPBF7117C (Serves Y3401). Similarly, FHAR Note 24 was resolved by adding the following: Power Supply & Cable 1CYE211A, Power Supply YF2, & Cable 2CYF211A. All other YE2 and YF2 load cables listed in Appendix C-3 were already part of the SAFE Cable Logics as ASSOCIATED cables and were reflected in the Level 1 Failure Reports. Additional calculations were performed for added PRA loads: 1. C-EE-003.02-033 concludes that all load circuit breakers coordinate with the supply circuit breakers for 13.8 kV Buses A & B. 2. C-EE-017.01-010 concludes that protective devices for the station annunciator are coordinated. 3. C-EE-001.01-007 concludes that no single breaker failure with fault results in a total loss of off-site power. Based on the breaker trip evaluation for faults on the 13.8kV, 25 kV and 345 kV systems, faults coincident with a breaker failure will result in at least one alternate source providing power to the 13.8 kV busses (and each startup transformer is sized to carry the full house load). 4. C-EE-002.01-019 concludes that both Distribution Panels DA1 and DB1 remain available following any downstream faults when powered from their normal supplies (the PRA does not credit power via the cross-connect).

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
CS-B1-02 (cont.)			Complete coordination studies. For miscoordination, ensure the effects are modeled in the Fire PRA (e.g., model load cables affecting upstream power supplies or perform a modification to ensure coordination).	The following calculations include some cases where protective device coordination is not confirmed. In these cases, the components and busses were identified as failed (assigned to UNL in the Fire PRA): A. C-EE-024.03-004 concludes that protective devices have been set to provide sufficient coordination to ensure that the SBODG busses Bus D3 & Panel L3042 remain available following any downstream phase to phase or ground fault, but there may be insufficient margin in coordination between the feeder and load breakers on MCCF81. Fire PRA Component Selection Notebook 10-01, Attachment D, shows that MCCF81 is failed for all fires in OS-2. (MCCF81 and all loads are located in the SBODG building, in OS-02.). B. C-EE-005.01-116 concludes that coordination is shown for Bus E2, but not for E21A & E23A. Fire PRA Component Selection Notebook 10-01, Attachment D, shows all E21A & E23A loads and Busses E21A & E23A failed for all scenarios. C. C-EE-005.01-117 concludes that coordination is shown for Bus F2, but not for F21A, F21C, & F23A. Fire PRA Component Selection Notebook 10-01, Attachment D, shows all F21A, F21C, & F23C loads and Busses F21A, F21C, & F23A failed for all scenarios. D. C-EE-017.01-011 concludes that protective devices for YAR & YBR generally provide coordination (for normal line ups); however, although Fuse YAR-FU3/YBR-FU3 and breaker BE2314/BF2315 are not coordinated, a fault occurring in this small area of non-coordination is unlikely and deemed acceptable.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
CS-B1-02 (cont.)				As a result of this finding, logic errors were corrected in the fire model but did not constitute significant changes in scope or capability that impacted significant accident sequences or accident progression sequences. Therefore, these changes are considered PRA Maintenance with no further review required. See Example 6 of non-mandatory Appendix 1-A, per ASME/ANS RA-Sa-2009.
PRM – Plant Response Model				
PRM-A2-01	Finding	Assessed to meet CC I-III	The current analysis does not re-evaluate the existing containment isolation analysis with regard to fire impacts. Since the screening criteria includes probability, this could have missed a situation where a fire could alter the probability and may restore currently screened isolation failures to the LERF model. The fire impacts may result in one or more open isolation lines that could result in additional LERF scenarios. Re-evaluate the existing screening based on fire impacts and include those identified scenarios into the model.	As recommended by the peer review team, a re-evaluation of the containment isolation analysis was performed with fire impacts in mind. As discussed in Section 7, Appendix D, of the Fire Response Model Notebook 10-02, over 100 penetrations were evaluated for screening or inclusion into the Fire PRA. The result of this finding was an increase in documentation to validate the containment penetrations appropriately screen. As no changes were made, this is a documentation enhancement only.
PRM-B2-01	Finding	Assessed to meet CC I-III	The verification of the impact of the disposition of F&Os from the internal event PRA peer review on the internal event based Fire PRA model is required, but no documentation was found in the PRM notebook. The verification of the impact of the disposition of F&Os from the internal event PRA peer review on the internal event based Fire PRA model was not documented in the PRM notebook. Although it is unlikely, it is possible to find some dispositions with potential impact that needs to modify the Fire PRA model. The impact of Internal event F&O dispositions on the internal event based Fire PRA model shall be verified and documented. (For examples, Internal event elements IE has 1 A F&O, 2 B F&Os; SC has 1 A, 1 B F&Os; SY has 2 A F&Os, 5 B F&Os; DA has 6 B F&Os; and LE has 3 Finding F&Os).	As recommended by the peer review team, a disposition of all internal event gaps has been performed for the Fire PRA model; a column was added to the 2008 internal event gap worksheet for Fire. A paragraph has been added to the Fire Response Model Notebook 10-02 discussing this disposition (Section 4.1, and it directs the reviewer to PRA Notebook 01-01, PRA Roadmap and Peer Reviews, for details of the review. In summary, the F&Os from the internal events were assessed to meet the appropriate capability category (CC) and had no impact on the Fire PRA that is in development. As a result of this finding, PRA Notebook 01-01, PRA Roadmap and Peer Reviews, was created. No resolutions identified the need to change the Fire PRA model; therefore, this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
PRM-B7-01	Finding	Assessed to meet CC I-III	The SR requires that the backend SRs for SC-A and SC-B be met. SC-B3 indicates that T/H analyses be performed to support assumptions related to success criteria, and SC-B5 requires a comparison to similar designs. The current DBNPS PRA model does not include a failure of the PORV to reclose following a closure of MSIVs or loss of main feedwater. PRAs performed for several similar designs (i.e., Oconee, Crystal River 3, and ANO-1) have included this failure mode and have found it to be a measurable contributor to core damage. Given that the current DBNPS fire risk is driven by decay heat removal scenarios, the inclusion of this failure mode could be important in evaluating risk insights. If the additional mode is included, the CDF/LERF may be altered and the current results could be somewhat underestimated. It may be that for DBNPS, the resulting pressurization is not sufficient to challenge a PORV, but no current documentation or thermal hydraulic assessments are provided to support this conclusion. Some supporting T/H assessment, actual data experience from LERs and/or additional modeling, should be provided to support the ultimate conclusion to be consistent with similar plant assessments and to ensure adequate representation of risk. Initial assessment during the peer review indicated that the peak pressure may not reach the PORV set point of 2450 psi. If this is confirmed, the assessment should be included to resolve the finding.	As recommended by the peer review team, a discussion has been added to the Fire PRA Model Notebook 10-02, Section 5, and a simulator evaluation was run, which proved the PORV set point is higher than the pressure limits reached following closure of the MSIVs. Therefore, the PORV will not open, and a failure of the PORV to reclose was not added to the model. As a result of this finding, the PORV set point was evaluated and found to not lift following a closure of the MSIVs. No changes were made to the PRA model thus this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
PRM-B7-02	Finding	Intent to meet CC I-III	The plant model was changed to add credit for the diesel driven AFW pump and FLEX equipment. However, the plant modifications and procedures are still in the developmental stage. As the plant modifications and procedure changes are completed, the PRA model should be re-evaluated to ensure that the model reflects the as-built, as-operated plant. Detailed model for these plant systems significantly impact the plant CDF and LERF. Update the plant model to reflect the as-built, as-operated plant upon modification completion.	As discussed in NOBP-CC-6001, PRA Model Management, Section 5.1.1, requires tracking and disposition of plant changes that may affect the PRA model. Section 5.1.1 specifically requires reviewing plant changes (e.g., design changes from a Design Interface Evaluation), evaluating the change (e.g., to determine significance), and identifying the change in a notification until it is incorporated into the PRA model (e.g., Notification 600676552). As such, when the EFW and FLEX plant modifications are implemented, and associated procedures are updated, the PRA model will be updated as required by NOBP-CC-6001. Since EFW and FLEX were in the fault tree during the time of the peer review, once installed, only minor changes to the model will be made. This will be a model refinement of existing methodology, and it is not expected to constitute significant changes in scope or capability that impacted significant accident sequences or accident progression sequences. Therefore, these changes are considered PRA Maintenance with no further review required (see Example 6 of non-mandatory Appendix 1-A, per ASME/ANS RA-Sa-2009).
PRM-B9-01	Suggestion	Assessed to meet CC I-III	The FLEX equipment is added to the model as point estimate of 1E-02. This value is said to be conservative but does not have any real justification to support this value. The failure probability for the FLEX equipment could be influenced by a number of factors, such as testing, procedural guidance, dependence on existing equipment, etc. This value should be re-evaluated as the designs for FLEX modifications become more well-defined. If the failure probability of FLEX equipment is impacted by elements of the design or procedures, the value could be under-estimated and impact the overall Fire PRA. Provide a more detailed justification for the failure probability of FLEX equipment and verify that this value is indeed conservative.	As recommended by the peer review team, the point value was expanded into a system fault tree. The system fault tree is discussed in the Fire PRA Model Notebook 10-02, Section 5, and it includes an HFE and key component failures (common cause). The detailed system fault tree results in a failure rate of 6.50E-03/yr. Also, see response to PRM-B7-02. As a result of the suggestion, a detailed model of the FLEX system was added to the model. This is a model refinement using existing methodology and is considered to be PRA Maintenance.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
PRM-B10-01	Finding	Assessed to meet CC I-III	Certain scenarios were identified during the MSO Expert panel review (ARS-DB-11-0005, Davis-Besse MSO Expert Panel Report) that have either been dispositioned as being of low significance or have yet to be modeled in the PRA (or have documented dispositions) that were used for the peer review. Examples of items that were dispositioned in Section 1.1 of Notebook 10-01 Fire PRA Component Selection: * PORV Spurious operation and challenge to RCS integrity (Single spurious operation, Related to MSO Scenario 18, 19), * Failure to isolate letdown and challenge to RCS integrity (Related to MSO Scenarios 6, 7), and * SP6A and SP6B SG Overfill (Related to MSO Scenario (Related to MSO Scenario 33). This equipment was not included in the Fire PRA even though it meets the above requirements of ES-A4-01. Other MSO-related scenarios appear to have modeling in the Fire PRA that was reviewed during the peer review that was either incomplete or did not consider the effects of fire. * MSO Scenarios 1-5 - Operators failing to trip the RCPs on a loss of seal cooling does not appear to account for fire impacts that could prevent tripping of the RCPs (e.g., logic under Gate Q01-2 "OPERATORS FAIL TO TRIP RCPs") and does not appear to acount for related cable failures (i.e., control power cables fire-induced failures that could prevent RCP trip from the control room) or account for the dc control power supply dependency to the switchgear, which is necessary to ensure that the RCPs can be tripped from the Control Room. * MSO Scenario 56 - SFAS3 and SFAS4 and resultant impact (which could result in an isolation of seal injection and thermal barrier cooling) were added to the Fire PRA (Reference MSO Report, Scenario 56). An example is Gate A354, "Fire Causes Loss of AC Power to 2 Channels of SFAS." The inputs to this gate are basic events. It is not clear if power supply logic structure should have been used instead of basic events to appropriately capture fire impacts on upstream power sources that are not modeled under Gate A354.	As recommended per the peer review team, the MSO report was reviewed for inclusion into the Fire PRA. Since the peer review, the MSO has gone through a complete review and update. The updated report was reviewed for inclusion into the PRA and validated the modeling criteria. As discussed in Section 1 (Subtask 4) of the Fire PRA Component Selection Notebook 10-01, the Fire PRA review included searching for new failure pathways, including the identification of additional components based on spurious operation. Specific F&O issues addressed include the following: MSO Scenario 19 describes adding spurious opening of the PORV to the model; MSO Scenario 33 describes adding failure of Flow Control Valves SP6A and SP6B to the model; MSO Scenarios 1-5 address loss of RCP seal cooling and describe that QHARCPCE-FIELD & QHARCP3E-FIELD have been added to the PRA for local manual action to trip the RCP breakers from the HVSGR (to address potential fire impacts that could prevent tripping the RCPs from the Control Room); MSO Scenario 56 describes the PRA modeling of a spurious SFAS actuation (including loss of seal injection and cooling, and seal return), and the model also addresses fire effects to Panels Y1-Y4 resulting in a spurious SFAS; MSO Scenario 24 describes modeling of the MSIVs and un-located TBVs in the PRA; MSO Scenario 36 describes that risk associated with spurious Pressurizer Spray was determined to be; and MSO Scenario 12 describes that spurious opening of Three-way Valves MU3971 and MU6405 have been added to the PRA (under Gates M118/M075 for MUP1 and M108/M074 for MUP2, which are 'anded' under M201 for a loss of seal injection). Appendix D of Fire PRA Component Selection Notebook 10-01 also includes a list of components/basic events identified as un-located and failed in all scenarios.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
PRM-B10-01 (cont.)			* MSO Scenario 24 - Failure to close the MSIV and spurious operation of downstream valves (Turbine Bypass Valves) were added to the Fire PRA model (see Gate F056 "MS100 FAILS TO CLOSE DUE TO SOV FAILURE FROM FIRE" "AND" Gate F2100 "ANY SG2 TBV FAIL TO CLOSE TO CONTROL PRESS. & MSIV FAILS TO CLOSE" and Gate F2150 "ANY SG2 TBV FAILS TO CLOSE TO CONTROL PRESSURE." A review model did not indicate that fire-induced failures had been considered for components under Gate F2150. Since F2150 is an AND gate, fire-induced failures of the MSIVs would not propagate through the model and would be non-conservatively masked. * MSO Scenario 36 - Spurious normal spray. ARS-DB-11-0005, Davis-Besse MSO Expert Panel Report, disposition of Scenario 36 was "Add spurious opening of RC2 to the Fire PRA model. Added failure to trip or the spurious start of RCPs to the Fire PRA model." This item, at the time of the peer review, had not been added to the model. A documented disposition of the issue did not appear to exist. * MSO Scenario 12 - Loss of suction to makeup pumps due to failure to isolate the makeup tank supply. ARS-DB-11-0005, Davis-Besse MSO Expert Panel Report, says that, "Added specific loss of the Makeup Pumps due to spurious opening to the makeup tank of three-way valves MU3971 and MU6405." This is modeled under AND Gate M200-1 "FIRES CAUSE SPURIOUS OPENING OF BOTH MU3971 & MU6405 TO MUT." This failure is intended to be propagated in the CAFTA model as a failure of both Makeup pumps. However, the only parent gate to M200-1 is OR Gate "INADEUQATE EMERGENCY BORATION BY MU SYS; 1 OF 2 MUPs FROM B & LETDOWN," This failure, while intended to show loss of both Makeup Pumps, does not propagate to a loss of seal injection. This would not capture the full effects of the impact of this spurious operation. These are examples based on a very limited review of selected MSO scenarios and their modeling in equipment selection and model development. A more complete review may be necessary.	A review of C-FP-013.10-018, Cable Selection, was also performed to ensure cable tracing was mapped to appropriate PRA components and failure modes (see Subtask 3 of Fire PRA Component Selection Notebook 10-01). A quality check was also performed between SAFE, which maps zone-raceway-cable-component, to FRANX, which maps component-BE. As a result of this finding, the MSO report was updated, and the PRA model was modified to include the failures as discussed in the documentation. The fault trees were revised as necessary using existing methodology; therefore, this is considered to be PRA Maintenance.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
PRM-B10-01 (cont.)			The equipment not cable traced were assumed to be failed using the UNL tag. However, there are several occurrences identified where the cable tracing was performed but did not capture equipment failures due to model to cable impact mismatches. In these cases additional equipment should have been defined and included in the PRA model. The model does not define any fire-related impacts and underestimate CCDP. The team did identify enough examples to confirm this conclusion but a detailed review is needed. A detailed re-evaluation of the MSO and equipment incorporation into the FPRA model to ensure that all fire impacts (from cable or equipment faults) are present in the model and also fails equipment as required by the fire model impacts is needed. One part of this process to ensure a quality check is to utilize the FRANX capability to map zone - raceway - cable - component - BE and ensure that cables have end points and that all necessary cables are routed. Note that the list developed above is not exhaustive but rather is representative of the finding.	
PRM-B13-01	Suggestion	Intent to meet CC I-III	The estimates for most components associated with the new EFW system are reasonable and consistent with experience. However, a review of the AFW pump failure data (FTR >1HR = 9.48E-5/hr) seems inconsistent with experience documented in the INEL database 2010 (FTR >1HR = 2.16E-03/hr) found on the INEL data site (http://nrcoe.inel.gov/resultsdb/publicdocs/AvgPerf/ComponentUR2010.pdf). The values for less than one hour FTR and FTS are also higher in the referenced database than report in the DBNPS Fire PRA. Given the current design state of the system and the importance of the system to improving fire response, the results are very sensitive to this value and additional support for the value should be presented or the generic estimate adopted. No documentation was identified for the values selected. The results are very dependent on the availability of the EFW system due to the contributions from loss of decay heat removal sequences.	It is understood that the Emergency Feedwater (EFW) system is important to the plant, as such the data set will comprise plant-specific data and will be maintained to the data set chosen. The generic data source to build the internal events PRA, as discussed in the PRA Data Notebook 06-01, is NUREG/CR-6928 and was chosen as the data source for the EFW system during the design phase. Section 5, Sensitivities, of the Fire Risk Quantification Notebook 10-05, includes a review of other EFW generic data sources and a sensitivity on EFW reliability. The resolution to this suggestion did not result in any changes to the PRA Model. Sensitivity studies were performed, and pump performance will be closely monitored to ensure the proper generic prior is being used.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
PRM-B13-01 (cont.)			The overall conclusions are, to a large degree, driven by the assessed value for availability. Provide documentation supporting the value used or update to a recognized generic failure rate.	
PRM-B15-01	Finding	Assessed to meet CC I-III	MODEL any new accident progressions beyond the onset of core damage identified per PRM-B14 to determine the fire-induced LERF in accordance with HLR-LE-A, HLR-LE-B, HLR-LE-C, and HLR-LE-D and their SRs in Section 2. This will include the following clarifications: a) All of the SRs under HLR-LE-A, HLR-LE-B, HLR-LE-C, and HLR-LE-D in Section 2 are to be addressed in the context of fire scenarios, including effects on system operability/functionality, operator actions, accident progression, and possible containment failures accounting for fire damage to equipment and associated cabling; b) LE-C2 and LE-C7 in Section 2 are to be met consistent with Section 4.2.10; c) LE-C6 in Section 2 is to be met consistent with PRM-B9 above; d) LE-C8 in Section 2 is to be met consistent with PRM-B6 above, and DEVELOP a defined basis to support the claim of non-applicability of any of these requirements in Section 2. A possible accident progression beyond the onset of core damage has been identified. This is currently under review. Documentation is required to support either modeling the new accident progression or justification for not modeling it. The documentation for the accident progression and the reason for modeling or not modeling should be included 10-02, Fire PRA Model. Develop a PRM-specific calculation or notebook that combines the pertinent portions of PRM documentation from existing documents or calculations. Resolve whether the new accident progression is valid or not. If it is valid, then model in the PRA model. Document the new accident progression, and the reason for modeling or not modeling should be included in 10-02, Fire PRA Model.	As recommended by the peer review team, Section 7 of the Fire Response Model Notebook 10-02 discusses LERF. A subsection has been added on Containment Buckling - the possible accident progression beyond the onset of core damage. As discussed in the Davis-Besse Severe Accident Mitigation Guidelines Technical Basis Document, sub-atmospheric containment (CTMT) pressure is not expected to challenge CTMT. As a result of this finding, PRA Notebook 10-02 was updated to include discussion of containment buckling. As this was determined to not challenge the CTMT, no changes to the model were made. Therefore, this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS – Fire Scenario an Selection Analysis				
FSS-A1-01	Finding	Assessed to meet CC I-III	The treatment for junction boxes as described in the Fire Modeling documentation (References in the format of: FIRE AREA ID_G-02 C-FP-013.10-##) is conflicting. Initially, the report indicates that the junction boxes are not considered. However, throughout the report, it is suggested that the junction boxes are screened because they are tightly sealed and robustly secured. Since the report suggest that the junction boxes have been evaluated and screened, evidence of the evaluation is necessary. Conflicting description on the treatment of junction boxes. Sample junction boxes throughout the plan to ensure they are robustly secured and tightly sealed and document (References in the format of: FIRE AREA ID_G-02 C-FP-013.10-##) these walkdowns. Include this evaluation in the documentation. Remove the statements in the reports indicating that junction boxes are not considered.	As recommended by the peer review team, the walkdowns were performed to confirm that the junction boxes are robustly secured and tightly sealed. The walkdown forms have been added to the fire model calculations. As discussed in the Fire Response Model Notebook 10-02, Section 5.7 and Attachment C, the Fire PRA includes a scenario that impacts the most risk-significant junction box in the compartment with the Bin 18 frequency applied. This method is conditional on the compartment having a junction box and some frequency for Bin 18. This method is consistent with FAQ 13-0006. As a result of this finding, walkdown forms were added to the detailed fire models. This is a documentation change, and FAQ methodology was followed; therefore, this is considered a documentation enhancement.
FSS-C5-01	Finding	Assessed to meet CC I - II	The damage criteria for sensitive electronics are implemented following DRAFT FAQ 13-0004, also documented in DBNPS Temperature Sensitive White Paper, Revision 0. This is still a draft FAQ, and the analysis will need to be updated once the FAQ is finalized. Implementation of damage criteria in the Fire PRA is based on a draft FAQ. Update the Fire PRA analysis to reflect the finalized version of FAQ 13-0004.	As recommended by the peer review team, FAQ 13-0004 was revisited upon its closure. FAQ 13-0004 was closed-out on December 3, 2013. The Verification and Validation report No. R1957-0511-0001 discusses the damage criteria implemented for temperature sensitive components. It is also consistent with the proposed method documented in Fire PRA FAQ 13-0004. As discussed in Section C.8, Fire Dynamic Simulator (FDS) simulations found that the heat flux and temperature experienced by components within the enclosure remained below that specified in Section H.2 of NUREG/CR-6850 for sensitive electronic equipment, while the exterior surface heat flux exceeded the generic screening damage threshold for thermoset cables.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-C5-01 (cont.)				These results support the recommendation that the heat flux damage threshold for thermoset cables, as observed on the outer surface of the cabinet, can be used as a conservative surrogate for assessing the potential for thermal damage to solid-state and sensitive electronics within an electrical panel (cabinet). This recommendation was only valid if certain caveats outline in FAQ 13-0004 were not present. Walkdowns were performed to identify if any equipment violated one of the caveats, and if they did, then the equipment used the sensitive electronic damage criteria instead. The closure of this FAQ aligned with the work performed for the DB Fire PRA. The documentation was updated to identify the finalized FAQ. No changes were made to the model. This is a documentation enhancement only.
FSS-C7-01	Finding	Assessed to meet CC I-III	An evaluation of dependencies of fire protection features among credited paths is not provided. A dependency evaluation among fire protection features or fire protection credited paths in an event tree (e.g., automatic suppression and the fire brigade) is required by the standard. The standard requires an evaluation for dependencies. Include in the Fire PRA an evaluation of dependencies among credited fire protection systems and fire protection paths.	As recommended by the peer review team, report R2232-0511-0002 documents the dependency evaluation for fire protection systems credited in the FPRA. Compartments for which automatic suppression was credited were evaluated for the following dependencies: detection systems credited to provide early warning and actuation, the same water source for manual and automatic suppression, and automatic/manual and safe shutdown capability. Each dependency was examined and dispositioned. Appendix A details the credited fire detection and suppression system dependencies. As a result of this finding, a dependency evaluation was performed. No changes were made as a result of this finding; therefore, this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-C7-02	Finding	Assessed to meet CC I-III	The quantification of fire scenario frequencies associated with main control board fires are not considering dependencies and are potentially "double counting" credit for suppression in the non-suppression probability factors. Specifically, a factor generated from Figure L-1 in NUREG/CR-6850, which includes credit for the non-suppression probability, is multiplied by an additional non-suppression probability term (used for propagating fires outside the panel of ignition) without accounting for the conditionalities between the two terms. The quantification of fire scenarios frequencies is potentially "double counting" credit for suppression, resulting in incorrect and non-conservative scenario frequency values for main control board scenarios. Apply credit for non-suppression probabilities considering dependencies between damage states resulting from an ignition source in a progression of fire scenarios to avoid “double counting” credit for non-suppression probabilities.	As recommended by the peer review team, the severity factor for the main control board panel is determined through the use of NUREG/CR-6850 Figure L-1. As discussed in C-FP-013.10-035, Section 6.8, Step 8.b, Conduct Fire Growth and Propagation Analysis, the probability of non-suppression is not double counted; it is a property of the exponential function used to calculate the probability of non-suppression (the calculation includes the equation). As a result of this finding, the severity factor for the Main Control Room was re-evaluated and now is consistent with existing methodology. This is a minor change to PRA data, and it is not expected to constitute significant changes in scope or capability that impacted significant accident sequences or accident progression sequences. Therefore, these changes are considered PRA Maintenance with no further review required. See non-mandatory Appendix 1-A, Example 6, per ASME/ANS RA-Sa-2009.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-C8-01	Finding	Intent to meet CC I-III	A justification for the rating of the credited fire barriers have not been provided in the fire modeling workbooks (References: FIRE AREA ID_G-02 C-FP-013.10-##). Fire barriers are credited in the analysis, but the technical basis for its credited rating is not available. In addition, there is significant credit for cable tray metal bottom covers preventing fire propagation throughout cable trays. The limited walkdowns conducted during the Peer Review Week allowed the peer review team the opportunity to do visual inspections of some of the configurations, and the credit provided in the analysis is consistent with the guidance in NUREG/CR-6850. There is no documentation in the fire modeling documentation of walkdowns conducted to verify all of the credited configurations or reference to plant procedures to maintain them. The standard requires establishing and documenting technical basis for credited fire barriers. Fire barriers are credited in the analysis, but the technical basis for its credited rating is not available. In addition, the Fire PRA credits bottom cover trays in preventing fire propagation. References to how these covers are or will be maintained are not provided. Add to the fire modeling documentation the technical basis supporting the credited rating for the barriers.	See PP-C3-01. In addition, as discussed in ARS-DB-13-074, Section 7, and the Transition Report Attachment S, Table S-2, Item DB-1744, as part of implementation of NFPA 805, FENOC will determine the future monitoring requirements for the fire protection program, including credited fire barriers. Each fire modeling calculation that credits Kaowool includes an open assumption to track the development of a monitoring program for Kaowool, including maintenance and surveillance inspections (Notification 600678666). As a result of this finding, a monitoring program will be created. This monitoring program is intended to verify assumptions made in the PRA remain true. Disposition of this finding did not result in any changes to the PRA model.
FSS-D2-01	Suggestion	Assessed to meet CC I-III	The V&V study R1957-0511-0001 does not address the scenario-specific fire modeling applicability ranges as suggested in the methodology described in NUREG-1824. The peer review activities suggest that the fire models are applied following good fire modeling practices and reflecting specific scenario conditions. A scenario-specific V&V study will provide a robust technical basis for the existing fire modeling calculations. Perform scenario-specific validation following the guidance in NUREG-1824 to complement the existing V&V study documented in R1957-0511-0001.	As recommended by the peer review team, report R1957-0511-0001, V&V of Fire Modeling Tools and Approaches for Use in NFPA 805 and Fire PRA Applications, has been updated. Section 5 provides the V&V basis for the calculation of various fire conditions, and Appendix G, LAR Attachment J, provides the fire modeling V&V basis for the fire models/model correlations used. As a result of this suggestion, multiple V&V reports were created. Disposition of this suggestion did not result in any changes to the PRA model; this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-D7-01	Suggestion	Assessed to meet CC II	Although DBNPS Report R2232-0511-0001 calculates plant-specific availability values for the fire detection and suppression systems credited in the analysis, the calculation of fire scenario frequencies documented in the fire modeling workbooks (References: FIRE AREA ID_G-02 C-FP-013.10-##) have not been updated to reflect the new values. The new values are currently reflected in the latest FRANX quantification. In some cases, the plant-specific unavailabilities are higher than the default value of 0.01 used in the fire modeling workbooks. The non-suppression probability values documented (References: FIRE AREA ID_G-02 C-FP-013.10-##) are based on assumed unavailability values that are optimistic and are not supported by plant specific values. Update fire modeling workbooks with values generated by the plant-specific availability evaluation in R2232-0511-0001.	As recommended by the peer review team, updates to the Fire Modeling workbooks have been made to appropriately reflect the detection and suppression availability if the generic fire protection system unavailability was greater than 0.01. As a result of this suggestion, the Fire Modeling Workbooks have been updated. The Fire PRA model had already accounted for the associated values; therefore, this is a documentation enhancement only.
FSS-E4-01	Suggestion	Assessed to meet CC I-III	The fire modeling documentation (References: FIRE AREA ID_G-02 C-FP-013.10-##) does not clearly state which cables are failed due to assumed routing in each scenario consistent with the discussion in the cable selection notebook C-FP-013.10-018, Fire PRA Cable Selection, Section 5.6. There is no impact on quantification. This suggestion is intended to improve documentation so that it's clear which cables are failed due to assumed routing. Add to the fire modeling workbooks (References: FIRE AREA ID_G-02 C-FP-013.10-##) tables listing which cables are failed due to assumed routing.	As discussed in C-FP-013.10-018, Section 5.6, cable routes and, therefore, locations, were assumed due to unscheduled cables and/or raceways in each compartment/scenario. As recommended by the peer review team, Section 5.5.1 of the individual fire modeling calculations have been updated also to identify which cables/raceways have an assumed route and which scenarios they were failed in. As a result of this suggestion, the fire modeling workbooks include tables listing which cables are assumed failed by scenario. This is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-F3-01	Suggestion	Assessed to meet CC II-III	The ignition frequency for the turbine building collapse scenario (TB-Collapse) does not match the value reported in the structural steel and quantification notebooks. This is not a systematic problem. This issue is localized due to the structural steel notebook not being updated to the latest quantification values. The Fire Modeling workbook documenting the frequency calculation matches the quantification values. The Structural Steel Notebook 17874-005.11 needs to be updated to reflect latest quantification frequency values. Update Structural Steel Notebook 17874-005.11 to reflect latest scenario frequency values.	As recommended by the peer review team, a revision to the structural steel calculation has been made and includes the reference to the detailed fire model that matches the frequency used during the quantification. As a result of this suggestion, the Structural Steel Notebook was altered to reference where the correct values could be obtained. The correct values were already accounted for in the Fire PRA; therefore, this is a documentation enhancement only.
FSS-G2-01	Finding	Assessed to meet CC I-III	The screening criteria for multi-compartments documented in C-FP-013-10-066 is based on frequency or CDF only considers screening of scenarios on individual basis. There is no consideration for cumulative risk. The report should specify the total CDF/LERF for all the multi compartment scenarios. The screening guidance for NUREG/CR-6850 for individual and cumulative risk needs to be followed. Add to the multi compartment report, C-FP-013-10-066, the screening analysis based on cumulative risk.	Section 11.5.4 of NUREG/CR-6850 provides several steps of screening Multi-Compartment Scenarios based on a qualitative screening, low fire load, and Frequency of Occurrence (FOC). Section 11.5.4.4, Step 4.c, mentions the ability to screen scenarios based on the Ignition Frequency, Severity Factor and Non-Suppression probability, and Barrier Failure probability. There is no need to discuss cumulative risk on scenarios screened based on FOC. Therefore, the F&O is considered resolved based on no screening using CDF was performed and all scenarios were kept. Therefore, from the Multi-Compartment Analysis, no cumulative risk needs to be assessed. The result of the finding concluded that per NUREG/CR-6850 screening based on FOC was allowed without consideration to total CDF/LERF. Therefore, this finding did not result in a change to the Fire PRA.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-G2-02	Finding	Assessed to meet CC I-III	The screening based on hot gas layer is incorrectly applied to the yard. Ignition sources, like the transformers that are next to the turbine building wall, were screened based on formation of hot gas layer in the "exposing" zone, which is not the appropriate fire condition to evaluate for the yard. Potentially contributing multi compartment fire scenarios were incorrectly screened out. Inspect ignition sources in the yard adjacent to the building (e.g., transformers, hydrogen tanks, etc.), and re-evaluate the screening decisions for these scenarios.	As recommended by the peer review team, hot gas layer (HGL) screening in the yard has been removed from C-FP-013.10-066, MCA. Calculation C-FP-013.10-058, "HGL Evaluation," Attachment 5, shows that several MCA HGL yard scenarios screen out due to dissipation. However, the following scenarios were included in Calculation C-FP-013.10-039, "Detailed Fire Modeling – Fire Compartment OS," Attachment 1, and represent impacts of equipment from the yard to inside the plant: OS.0102A-1 (X11_EH → II-01 targets) OS.0104A-1 (X02 → AB-05 targets) OS.0105A-1 (XAC → S-01 targets) OS.0106A-1 (XBD → Q-01 targets) As a result of the finding, the Multi-Compartment Analysis (MCA) was not updated. However, new scenarios were considered as part of the detailed fire model. This did not constitute significant changes in scope or capability that impacted significant accident sequences or accident progression sequences. Therefore, these changes are considered PRA Maintenance with no further review required. See non-mandatory Appendix 1-A, Example 1, per ASME/ANS RA-Sa-2009.
FSS-G4-01	Finding	Assessed to meet CC II	Section 4.4 of the multi-compartment report, C-FP-013-10-066, describes the process for calculating barrier failure probabilities. However, the justification for credited fire barrier rating is not provided in the document as required by FSS-G4. The technical justification addressing the requirement for Confirm and Assess in the SR are not included in the report. Walkdowns for confirming barriers and credit for the Appendix R program (e.g., surveillance program for walls, etc.) should be described in detail in the report.	See PP-C3-01 & FSS-C8-01. The justification for credited fire barrier rating is maintained in the Fire Hazards Analysis.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-G5-01	Finding	Assessed to meet CC II-III	The documentation for the multi-compartment analysis, C-FP-013-10-066, does not list the identified barriers applicable to each multi-compartment combination. A question was submitted during the peer review process requesting this information, and the plant staff provided the requested information. With the information provided, the calculation of barrier failure probabilities was reviewed. This finding is focused on documentation. Documentation of the multi-compartment analysis is incomplete. The documentation does not include enough information for supporting the calculation of barrier failure probabilities, which is an important parameter for quantification. Include in the documentation the information necessary to reproduce and better describe the calculation of barrier failure probabilities.	As recommended by the peer review team, C-FP-013.10-066, Attachment A, lists the barriers applicable to each multi-compartment. For example, Exposing Compartment A-01 is Exposed to Compartment A-02 via: 1) a door to Room 101A; 2) barriers (with permanent openings or non-substantial) to Rooms 109A-E & 109-E; 3) penetrations to Rooms 109A-E-025, 109-E-011, etc.; and 4) holes/openings to Rooms 109-E-110 & 110-W-109. Attachment A also shows each fire barrier probability, which was used to support calculating the resulting fire barrier probabilities between the Exposing Compartment and the Exposed Compartment. Table 5 includes the resulting fire barrier probabilities for all non-screened propagation pathways. Barrier failure probabilities are disused in Section 5.4. As a result of this finding, a separate section in C-FP-013.10-066 was created to better describe the calculation of the barrier failure probability. Therefore, this is a documentation enhancement only.
FSS-G6-01	Finding	Assessed to meet CC II-III	The quantification of multi-compartment combinations with more than two physical analysis units includes a "dilution" factor of 0.1. This factor is not described in generic industry guidance documents, and an appropriate technical justification for it is not provided in the multi-compartment report. The use of the dilution factor affects the quantification and the calculated risk contribution of multi-compartment fires. Remove the dilution factor from the scenario frequency quantification process.	As recommended by the peer review team, C-FP-013.10-066, MCA, has been updated, and the dilution factor has been removed (Section 5.7). As a result of this finding, the dilution factor has been removed and the calculation has been updated. This is in accordance with existing methodology and is, therefore, not considered a PRA Upgrade.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-H1-01	Suggestion	Assessed to meet CC I-III	Fire modeling workbooks documented (References in the format of: FIRE AREA ID_G-02 C-FP-013.10-##) are intended to have similar headings and discussions among them. Inconsistencies were found: 1. Some workbooks do not have the discussion on treatment of smoke damage 2. Some workbooks do not have a discussion on fire growth for transient fires. There may be other examples that were not identified during the peer review activities.	As recommended by the peer review team, the Fire Modeling workbooks were updated to include a standardized heading and section. As a result of this suggestion, the Fire Modeling workbooks have been updated to include standardized headings and section numbers. This is a documentation enhancement only.
FSS-H2-01	Finding	Assessed to meet CC II-III	Documentation for target damage criteria should be updated. 1. The fire modeling workbooks (References in the format of: FIRE AREA ID_G-02 C-FP-013.10-##) do not describe how the target damage criteria is applied to calculate different times to target damage. Specifically, information about which specific targets are mapped to thermoset or thermoplastic criteria is not listed in the workbooks. 2. The treatment for sensitive electronics is based on a draft FAQ, Fire PRA FAQ 13-0004. The analysis and documentation should be revised once the FAQ is final so that it reflects latest Fire PRA guidance. Fire modeling documentation (i.e., workbooks) includes limited description on the methodology followed to assign damage criteria to target sets. In addition, there is no listing in the documentation on the characterization for each target. This is an important input to the analysis, particularly because calculations are based on more than one damage criteria (different targets may be thermoplastic or thermoset in a given scenario). Improve documentation so that the treatment of targets in individual scenario is clear.	As recommended by the peer review team, 1. The “Walkdown Data” tab in Attachment 1 of each Fire Modeling calculation includes a table that identifies the closest Vertical Target and Horizontal Target for each Bin and Ignition Source. The target damage criteria used for each Vertical and Horizontal target was K for Kerite, TP for thermoplastic, or TS for thermoset. Attachment A 2 and 3 of each Fire Modeling calculation also includes a table that identifies the damage criteria used for each Fire PRA related equipment and raceway target. 2 See FSS-C5-01 for treatment of sensitive electronics (FAQ 13-0004). Also, the methodology for identifying and characterizing targets is included in Section 7.5 of EPM-DP-FP-001, Detailed Fire Modeling. It discusses Target Sets considered and characterizing Target Set Damage criteria. As a result of this finding, the Fire Model workbooks have been updated to improve documentation. Therefore, this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-H3-01	Finding	Assessed to meet CC I-III	The fire modeling documented in the fire modeling workbooks (References in the format of: FIRE AREA ID_G-02 C-FP-013.10-##) provide no technical description of the fire modeling calculations. The workbooks require detail inspection of the spreadsheets to understand which models are used and how they are used. A description of fire growth and propagation, timing calculations, etc. is necessary. The fire modeling programmed in the spreadsheets is not described in the fire modeling workbooks (References in the format of: FIRE AREA ID_G-02 C-FP-013.10-##). Include as part of the documentation a description of the fire modeling analysis calculations supporting the spreadsheet analysis.	As recommended by the peer review team, a Technical User's Guide has been developed for the DBNPS Detailed Fire Modeling Workbook (DFMWB). The guide explains features and functionality of the workbooks: Section 2.6.1 discusses fire growth and propagation analysis, 2.6.2 discusses zone of influence and HGL calculations, 2.6.3 discusses fire scenario frequency, and 2.6.4 covers target impacts, etc. As a result of this finding, a Technical User's Guide was developed to better describe the fire modeling calculations. This is a documentation enhancement only.
FSS-H5-01	Finding	Assessed to meet CC II	The control room abandonment and analysis in reports (C-FP-013.10-034, C-FP-013.10-035) should be updated to clarify how results are represented. Updates to add clarifications and/or justifications for the following areas are necessary: 1. Justification for HVAC unavailability values 2. The report does not reference a procedure directing operators to switch the HVAC to smoke purge mode. References are necessary. The assumption of switching HVAC to smoke purge mode at the time of ignition is not justified currently. An available procedure for this can help develop a justification if described in the report. 3. The report does not describe how severity factors were calculated. Please describe. For example, the 98th percentile for transient fires is 317 kW (which should have a SF of 0.02). However, Table 20 lists as SF of 1.2E-2 for 312 kW. I was expecting to see this value higher than 0.02. 4. By inspecting results table, it appears that the heat release rate needed for abandonment is approximately 300 kW (see for example Table 18 and 22). In Table 23, why there is no abandonment after 300 kW.	As recommended by the peer review team, 1. Calculation C-FP-013.10-035, Task 5.11b Main Control Room Analysis, has been updated and does not provide any credit for the MCR HVAC system. Discussions with operations indicated that HVAC will isolate on smoke detection and the restart is a manual action. It was estimated that it may take up to 30 minutes to manually initiate due to other workloads. At that point, credit for smoke purge is irrelevant. 2. Procedure DB-OP-06511 directs operations to switch HVAC to smoke purge mode. As discussed in Item 1, the HVAC system is switched to full outside air mode at 30 minutes based on DB-OP-06511 and on discussion with plant operators. It was, therefore, not credited during the Main Control Room Abandonment Analysis, C-FP-013.10-035. 3. C-FP-013.10-034, Section 1, has been updated to describes that the severity factors are from Appendix E of NUREG/CR-6850, Tables E-2, E-3, and E-9.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-H5-01 (cont.)			These technical issues were submitted as questions during the peer review, and the plant staff provided satisfactory answers. Therefore, this is strictly a documentation issue. The report does not provide enough technical detail to justify the modeling approach. Update the report as recommended in the text of the finding.	4. The MCR abandonment scenarios in Calculation C-FP-013.10-034 have been updated, and each analyzed case contains scenarios that reach the abandonment conditions. As discussed in Section 8.4, electrical cabinet scenarios postulate fire propagation to two adjacent cabinet vertical sections, which results in a total of 3 cabinet vertical sections modeled with the peak heat release rate identified for each bin. As a result of this finding, credit for HVAC has been removed, and justification for transient fire severity factors has been provided. Data errors are being corrected and are not expected to constitute significant changes in scope or capability that impacted significant accident sequences or accident progression sequences. Therefore, these changes are considered PRA Maintenance with no further review required. See non-mandatory Appendix 1-A, Example 6, per ASME/ANS RA-Sa-2009.
FSS-H8-01	Best Practice	N/A	Although Finding FSS-G5-01 indicates that the supporting information for determining the barrier failure probability is not included in the multi-compartment report, C-FP-013-10-066, the database and quantification module developed for calculating barrier failure probabilities is very robust, is based on plant-specific data, and will allow for easy maintenance and updates. The use of electronic plant information for identifying barriers and automating the process of calculating barrier failure probabilities is recognized as a robust approach for supporting the multi-compartment analysis.	N/A – Best Practice

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
FSS-H10-01	Finding	Assessed to meet CC I-III	Fire modeling documentation (References: FIRE AREA ID_G-02 C-FP-013.10-##) provides no evidence that confirmatory wakdowns for target locations were conducted. Walkdown forms are available and were presented during the peer review. The fire modeling documentation needs to be updated to reflect and reference the walkdowns. Confirmatory walkdowns for conduit locations are a requirement of the standard. There is no evidence in the documentation that the walkdowns were conducted. Since the walkdowns were conducted, they need to be documented. Reference walkdown forms in documentation (References: FIRE AREA ID_G-02 C-FP-013.10-##).	As recommended by the peer review team, walkdowns were performed and forms are available in the fire modeling documentation. As a result of this finding, walkdown forms have been included in the fire modeling workbooks. This is a documentation enhancement only.
IGN – Ignition Frequency				
IGN-A1-01	Finding	Assessed to meet CC I-III	The documentation indicates that Beaver Valley was the starting point. Although both are PWR designs, the units have several NSSS and ECCS differences, such as HPSI versus MUP, number of PORVs, RCP seals, etc. No other sites are discussed such as Oconee, ANO, or Crystal River 3, which are of similar design. Although it is true that the BVNPS data is readily available, it is not clear that the starting list can be considered complete. Further, the text indicates that the starting point was a "BVNPS component list," which infers a component and not system listing. This should lead to an inclusion/exclusion assessment, which is not provided or documented. The use of BVNPS may not provide a robust listing for the B&W design. Exceptions or additions should be documented to show a complete listing for DBNPS. Remove the specific references to BVNPS and/or discuss more B&W-specific system information.	As recommended by the peer review team, additional reviews of C-FP-013.10-008, Fire Ignition Frequencies, were performed to look for site-specific equipment, and no new components or systems were identified for DBNPS. As a result of this finding, C-FP-013.10-008 was reviewed for any site-specific equipment that could be an ignition source. No new sources were identified; therefore, this is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
IGN-A5-01	Finding	Assessed to meet CC I-III	DBNPS used the generic data for establishing the ignition frequencies that are based on reactor years of operation. For ignition sources that are only possible during at-power operation, DBNPS did not adjust the frequencies for at-power only ignition sources to include plant availability. For ignition sources that are only possible during at-power operation, adjust the generic ignition frequencies by multiplying the generic frequencies by the average plant availability	As recommended by the peer review team, the PRA model has been updated to include the plant availability factor in the final calculation of the scenario frequency. The default Initiator %F-T1 has been added under an AND gate with the plant capacity factor. FRANX inserts all initiators under %F-T1; therefore, all scenario cutsets include the IGF as calculated in C-FP-013.10-008, the SF, and the plant capacity factor. As a result of the finding, the fire frequencies were modified to account for the plant capacity factor. This is a correction to data only and no new methodology was introduced, therefore this is considered to be PRA maintenance
IGN-A7-01	Finding	Assessed to meet CC I-III	Use a plant-wide consistent methodology based on parameters that are expected to influence the likelihood of ignition to apportion high level ignition frequencies (e.g., plant-wide values) to estimate physical analysis unit or ignition source level frequencies. The following assumption was made: When analyzing historical event data, it could not be determined whether or not electrical equipment (e.g., cables and electrical cabinets) employ thermoset or thermoplastic insulation and/or jackets. Therefore, all the events for any given ignition source type were combined, and the resulting frequencies should be used for both types of cable insulation and jacket material (NUREG/CR-6850 [DIN# 2], Section 6.3.1). It is unclear what the assumption is or which insulation was assumed to be used. This methodology is used plant-wide, so the assumption needs to be more specific and clearly state which insulation was used in the frequency calculation.	As recommended by the peer review team, calculation C-FP-013.10-008, Fire Ignition Frequencies, was updated to clarify what is discussed in the fourth assumption on thermoset or thermoplastic insulation and/or jackets (the Assumptions are listed under Analysis Methodology, Item 8). The calculation was updated to discuss that because both thermoset and thermoplastic insulation and/or jackets are used at DBNPS for electrical equipment (e.g., cables and electrical cabinets), all events for a given ignition source type were combined, and the resulting frequencies were used for both types of cable insulation and jacket material. As a result of this finding, a clarification statement was added to C-FP-013.10-008. This is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
IGN-A8-01	Finding	Assessed to meet CC I - II	The assessment of cable frequency excludes containment cable frequency. For DBNPS, there appears to be no reason to believe that cable fires, if possible in other areas, are not credible for the containment. The exclusion is correctly accommodated by the analysis by excluding the containment weight from the total, but it is not clear that the CCDP impact is the same, which results in a potential quantification issue. The calculated frequency is 2.86E-04/yr based on the containment weight. The total frequency of the containment is currently 8.1E-3/yr. The omission represents a small but measurable underestimation of frequency. It also increases the frequency for all other PAUs by roughly 7%. The containment cable routing is typically concentrated at two or four electrical penetration areas. A fire at one location could result in a loss of a division of indication and could cause a spurious opening of the PORV. This scenario may be missed by the current assessment. Basically, the concern is that the CCDP may be higher in the containment, and no suppression credit is possible such that the overall assessment may be non-conservative. Incorporate the weight already documented in Attachment 4 to define a contribution for the containment and add that into the assessment.	As discussed in NUREG/CR-6850, Fire PRA Methodology for Nuclear Power Facilities, Volume 2, Task 6, Step 6, Fixed Fire Ignition Source Counts, equipment counts are used to establish an ignition source weighting factor, and bins can be used to group equipment types. Consistent with NUREG/ CR-6850, DBNPS binned equipment and used Bin 12 for Cable Run. NUREG/CR-6850 identifies the location of equipment for Bin 12 - Cable Run, as "Plant-Wide Components." "Plant-Wide Components," as defined in NUREG/CR-6850, Table 6-2, are: "All plant locations inside the fence other than the containment, fuel handling building, office buildings, maintenance yard, maintenance shop, etc." Calculation C-FP-013.10-008, Fire Ignition Frequencies, includes a reference to Table 6-2 of NUREG/CR-6850 for Bin 12, the applicable location of Plant-Wide Components. Disposition of this finding did not result in any changes to the model. Per the definition in NUREG/CR-6850, plant-wide components do not include containment; therefore, the Plant-Wide Cable Weight remained unchanged.
IGN-A9-01	Suggestion	Assessed to meet CC I-III	The requirement is to POSTULATE the possibility of transient combustible fires for all physical analysis units regardless of the administrative restriction. There were interviews with Maintenance and Operations for the probability of transient loads, which were not documented. It is suggested that these interviews be documented so that future updates can verify that the probability of transient load fires has not changed. Document interviews with Maintenance and Operations involving transient loads and room occupancy.	As recommended by the peer review team, insights from the Maintenance and Operations interviews associated with categorizing the frequency of maintenance in a compartment (low, average, high, or very high) are included in C-FP-013.10-008. As a result of this suggestion, documentation of the interviews were included in the ignition frequency calculation. This is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
IGN-B1-01	Finding	Assessed to meet CC I-III	Attachment 7 in C-FP-013.10-008 states the frequency per fire bin but does not document the component frequency or the method used. It is difficult to review and verify that the methodology used is correct. Also, if changes are made in the plant, it would be difficult to update the table. An ACCESS database was used to calculate the frequency. The database is not part of the DBNPS notebook and may not be a controlled document. Document the method for using the database to calculate the frequencies. Reference the database in the Ignition Frequency Notebook. Ensure that the database is a controlled document or is in the software program.	As recommended by the peer review team, calculation C-FP-013.10-008 provides the overall methodology for determining fire ignition frequencies. It includes the formulas used, the counts for each bin, and the final frequencies for each bin in each compartment. An Access database is used to perform the calculation, and the V&V on the database is included in the calculation. As a result of this finding, C-FP-013.10-008 was updated to include documentation of the access database and the V&V process it sustained. Therefore, this is a documentation enhancement only.
CF – Circuit Failures				
CF-A1-01	Finding	Assessed to meet CC I-III	It appears that Table E-2 of C-FP-013.10-019 includes the assignment of spurious operation probabilities to instrument cables, which are typically shield low voltage circuits that fall outside of the criteria presented in Section 3 of C-FP-013.10-019. This criteria is from Section 10.5.2 of NUREG/CR-6850. Given that instrument circuit hot-short induced spurious operation has not been part of the testing used to develop the Tables in NUREG/CR-6850 or subsequent testing that will be addressed in NUREG/CR-7150 (refer to NUREG/CR-7150, Vol. 1, Sections 2.3.2 and 5), the values used do not appear to be supported by industry values or have a plant-specific basis. The specific criteria that are not consistent with the treatment of instrument circuits are: 1. The circuit is of grounded design (including impeded grounded systems with ground fault trip capability). 2. The cable is part of a control circuit for a typical component (e.g., noncomplex MOVs, SOVs, etc.). In addition to instrument circuits, the spurious operation probabilities were also used for ungrounded dc circuits. Ungrounded dc circuits spurious operations, however, have been tested, and the results, as understood by the reviewer, will be addressed in Vol. 2 of NUREG/CR-7150 and can be adjusted as necessary following the appropriate update process.	As recommended by the peer review team, Calculation C-FP-013.10-019, Circuit Failure Mode Likelihood Analysis, has been updated to use industry-supported values. Section 6.2 and Tables C-1 and C-2 have been updated to show that spurious operation probabilities for instrument cables have been removed (i.e., Cable IDs: 1LLC6459C, 1LLC6459D, 1LLC6459E, 1LLC6459F, 2LLC6460A, 2LLC6460C, 2LLC6460C, 2LLC6460D, 2LLC6460E, and 2LLC6460F). Previously, if an instrumentation cable was given a spurious event probability, there also was a control cable that was failed; therefore, there was no impact to the PRA model by removing the spurious event from the instrumentation. As a result of this finding, the spurious event probabilities for instrumentation cables have been removed. Logic errors were corrected in the fire model, but they did not constitute significant changes in scope or capability that impacted significant accident sequences or accident progression sequences. Therefore, these changes are considered PRA Maintenance with no further review required. See non-mandatory Appendix 1-A, Example 6, per ASME/ANS RA-Sa-2009.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
CF-A1-01 (cont.)			In addition to instrument circuits, the spurious operation probabilities were also used for ungrounded dc circuits. Ungrounded dc circuits spurious operations, however, have been tested and the results, as understood by the reviewer, will be addressed in Vol. 2 of NUREG/CR-7150 and can be adjusted as necessary following the appropriate update process. Use of values that are not appropriate industry-wide generic values does not meet the standard. Update the model to use appropriate industry-wide generic values.	
HRA – Human Reliability Analysis				
HRA-A2-01	Suggestion	Assessed to meet CC I-III	The MCR abandonment HRA does not include an action to manually trip the reactor before leaving. The final MCR abandonment procedure will include an action to trip. Therefore, this execution action should be added to the HRA for completeness. This actions would have a small impact on the HEP for MCR abandonment and would not change the conclusion in Section 12 of the HRA report. Add Rx Trip to MCR Abandonment HRA.	As discussed in Section 12, Main Control Room Abandonment, of the Fire PRA HRA Notebook 10-03, procedures require several actions be taken prior to leaving the Control Room. The first action is to trip the reactor from the affected pushbutton; if the reactor does not trip, then Ops is trained to open the CRD power busses and trip the CRD breakers. This is a documentation enhancement only.
HRA-A4-01	Finding	Assessed to meet CC II-III	Section 11.0 of the Fire HRA report provides the general discussion for operator interviews and simulator observations. However, detailed information gained from the operator interviews and observations is not provided in either the Operator Interview Insights section of the HRA Calculator worksheets or as separate interview sheets. Interview documentation is needed to facilitate maintenance and update of the HRAs once the HRA engineer or the operator is not available. Document the HRA interviews in a manner that ensures that information necessary for the HRA development (timings, procedures, tools, plant conditions) are consistently gathered.	As recommended by the peer review team, details of the operator interviews have been included in the HFE evaluations in the HRA Calculator; Attachment C of the Fire PRA Human Reliability Analysis Notebook 10-03 includes reports for all fire-affected HFEs. As a result of this finding, documentation of operator interviews have been included in the Fire HRA Notebook. This is a documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
HRA-B1-01	Finding	Assessed to meet CC I - II	The HRA for MCR abandonment does not include evaluation of the cognitive decision to abandon the MCR. If the shift manager does make the decision to abandon in a timely maNner, the fire could disable the ability to swap control to the Auxiliary Control Panel. Given the operator's penchant for remaining in the control room, this action could be a significant contributor to the overall HEP for MCR abandonment. Perform a cognitive evaluation of MCR abandonment.	As recommended by the peer review team, a discussion is included in Section 12, Main Control Room Abandonment, of the Fire PRA HRA notebook 10-03. The decision to abandon the Control Room is the cognition. This decision would not be made lightly, and the plant would not be in this sequence of events if the crew did not decide to abandon. The HEP was modified to account for the cognitive decision to abandon the MCR. No new methodologies were introduced, and the changes did not constitute significant changes in scope or capability that impacted significant accident sequences or accident progression sequences. Therefore, these changes are considered PRA Maintenance with no further review required. See non-mandatory Appendix 1-A, Example 23, per ASME/ANS RA-Sa-2009.
HRA-B2-01	Suggestion	Assessed to meet CC I-III	The cognitive evaluations for the HRAs impacted by fire are increased by a factor of 5 or 10 based on non-severe vs. severe fire. These factors are discussed in the details of the HRA Calculator worksheets but are not discussed in the Fire HRA report. Without this discussion, the updates to Fire HRA might not be performed consistently. Add discussion on the application of these factors in the Fire HRA report.	As recommended by the peer review team, Section 4 of the Fire PRA Human Reliability Notebook 10-03 has been updated; it discusses that factors of 5 and 10 were applied to Pcog for -FIRE and -FIRE-S HFEs, respectively, to account for fire impacts to instrumentation. As a result of this suggestion, documentation about the factor of 5 and 10 was added to the 10-03 Notebook. This is a documentation enhancement only.
HRA-E1-01	Suggestion	Assessed to meet CC I-III	The MCR Abandonment HRAs are included in the Fire HRA report but are not included in the HRA Calculator. These events should be included to allow update. MCR abandonment HRAs need to be in the HRA Calculator in order to update them. Add MCR Abandonment HRAs to the HRA Calculator.	As recommended by the peer review team, the MCR Abandonment HFEs have been added to the HRA Calculator, and copies of the HFE reports are included in the Fire PRA HRA Notebook 10-03, Attachment C. These HFEs are included in a separate database than the rest because these are independent actions for a special circumstance. As a result of this suggestion a HRA Calculator database was created to include the HFEs for MCR Abandonment. This is done for documentation enhancement only.

Table V-1 Fire PRA Facts and Observations

SR	Level	Status	Fact/Observation	Disposition
UNC-A1-01	Best Practice	N/A	The Fire PRA Uncertainty Notebook should be used as a template for other sites to use in the industry. It contained a comprehensive list of assumptions, meaningful sensitivities, and distributions for both CDF and LERF.	N/A – Best Practice

Table V-2 Fire PRA – Summary of Capability Category I SRs

SR	Topic	Resolution
CS-A2	CC I Cable selection methodology and results are documented in C-FP-013.10-018, Revision 0, which identifies and locates cables associated with components that support the Fire PRA and other analyses related to NFPA 805 transition. A portion of the work was previously completed for safe shutdown analysis (SSA) components, evaluated as part of the deterministic Appendix R analysis, in the Davis-Besse Unit 1 Fire Hazard Analysis Report (FHAR), Section 3.8. The existing FHAR component and cable selection/location data was used as a starting point for the additional work in C-FP-013.10-018. The cable selection included cables for operation, as well as spurious operation of equipment. The maximum number of cables involved could not be discerned for the existing FHAR analyses, since the methodology described in the FHAR did not explicitly describe this statement.	As discussed in the resolution to F&O CS-A2-01, the methodology for cable selection and cable location data associated with cables credited in Appendix R (FHAR, Revision 25) has been verified against NEI 00-01, Revision 2, and found to align or align-with-intent. Therefore, the PRA meets the intent of CC II of this requirement.
CS-B1	CC I Coordination for safe shutdown power supplies, which was used as input to the Fire PRA, is documented in Section 5.1 and Appendixes C-2 to C-3 of the FHAR. The adequacy of the referenced evaluations in the FHAR to meet the Fire PRA Standard has not been determined. This is documented as Open Item DB-0784 (Action Item 1) and is referenced in C-FP-013.10-018, Fire PRA Cable Selection, Revision 0, Assumption 3.7. Some of the previously analyzed power supplies in the FHAR seem to not be properly coordinated and have been evaluated using "fire area-specific" resolution strategies based on load cable routing and deterministically credited success paths. These strategies do not appear to have been addressed in the Fire PRA. Protective device coordination for power supplies relied upon in the Fire PRA that were not previously addressed in the FHAR have not yet been demonstrated. Studies were underway at the time of the peer review. This is documented as Open Item DB-0784 and is referenced in C-FP-013.10-018, Fire PRA Cable Selection, Revision 0, Assumption 3.7.	As discussed in the resolution to F&O CS-B1-02, protective device coordination for power supplies relied upon in the Fire PRA that were not previously addressed have been demonstrated via additional calculations. Therefore, the PRA meets the intent of CC II of this requirement.
HRA-A4	CC I Section 11.0 of the Fire HRA report provides the general discussion for operator interviews and simulator observations. However, detailed information gained from the operator interviews and observations is not provided in either the Operator Interview Insights section of the HRA Calculator worksheets or as separate interview sheets.	As discussed in the resolution to F&O HRA-A4-01, details of the operator interviews have been included in the HFE evaluations in the HRA Calculator, and Attachment C of the Fire PRA Human Reliability Analysis Notebook 10-03 includes reports for all fire-affected HFEs. Therefore, the PRA meets the intent of CC II of this requirement.

W. Fire PRA Insights

37 Pages Attached

W.1 Fire PRA Overall Risk Insights

Risk insights were documented as part of the development of the Davis-Besse Nuclear Power Station (DBNPS) Fire Probabilistic Risk Assessment (FPRA). The calculated fire core damage frequency/large early release frequency (CDF/LERF) were derived using NUREG/CR-6850 methodology for FPRA development. The results were useful in identifying the areas of the plant where the fire risk is greatest as well as understanding the risk significance of multiple spurious operations (MSOs). The risk insights generated were also useful in identifying areas where specific contributors might be mitigated via modification.

Using the definition of "significant" from the American Society of Mechanical Engineers (ASME)/American Nuclear Society (ANS) PRA Standard (for the term significant accident sequence) the fire initiating events that sum to 95% of the collective CDF or those whose contribution is more than 1% of the total Fire CDF are considered to represent the significant fire scenarios. For DBNPS over 2300 scenarios were quantified. Of those scenarios approximately 660 are multi-compartment related, 35 were left at the compartment level burn without performing detailed fire modeling, and of the compartments remaining about 1600 detailed fire modeling scenarios were created. The contributors to the calculated total CDF of the As-Built As-Operated Plant are as follows (note the scenarios contributing to LERF are similar): 24 scenarios contribute > 1%. To achieve 95% contribution more than 127 scenarios must be considered, with the 88th ranking scenario having a CDF contribution of < 0.1%. Table W-1 presents the current as built as operated plant (no modification) top 24 scenarios that contribute > 1.00% and account for ~70% of the total plant risk due to fire.

Given the results of the As-Built As-Operated plant scenarios as seen in Table W-1, along with a series of sensitivities regarding Detailed Fire Modeling (DFM) the plant decided something more than fire wrap and traditional mitigation features would be required. After looking at the results in Table W-1, it was observed that the dominant sequences among the top scenarios involved a loss of feedwater. In order to mitigate the risk the decision was made to install a new independent train of feedwater. It will be located in a completely separate building so current fire scenarios and the multi-compartment analysis would not impact the new system. The new train is diesel powered, and it will have a new tank from which the new pump will take suction. Table W-2 presents a review of the top scenarios for the Transitioning Plant. The table below shows the breakdown of scenarios and their relative importance after installing the modifications credited for risk reduction (i.e., Emergency Feedwater, FLEX RCS Charging Pumps, and Oil Collection Pans).

Contributions of Scenarios by Modeling (Post Transition Model)

Level of Fire Modeling	# of Scenarios	CDF	% Contribution	LERF	% Contribution
Compartment Level (no DFM)	35	2.83E-07	0.71%	9.50E-09	0.81%
Detailed Scenarios	1658	3.65E-05	91.71%	1.10E-06	93.22%
Multi-Compartment	661	3.06E-06	7.69%	7.10E-08	6.02%
Totals	**2354**	**3.98E-05**	**100%**	**1.17E-06**	**100%**

W.2 Risk Change Due to NFPA 805 Transition

In accordance with the guidance in Regulatory Position 2.2.4.2 of Regulatory Guide (RG) 1.205, Revision 1:

> *The total increase or decrease in risk associated with the implementation of NFPA 805 for the overall plant should be calculated by summing the risk increases and decreases for each fire area (including any risk increases resulting from previously approved recovery actions). The total risk increase should be consistent with the acceptance guidelines in Regulatory Guide 1.174. Note that the acceptance guidelines of Regulatory Guide 1.174 may require the total CDF, LERF, or both, to evaluate changes where the risk impact exceeds specific guidelines. If the additional risk associated with previously approved recovery actions is greater than the acceptance guidelines in Regulatory Guide 1.174, then the net change in total plant risk incurred by any proposed alternatives to the deterministic criteria in NFPA 805, Chapter 4 (other than the previously approved recovery actions), should be risk-neutral or represent a risk decrease.*

W.2.1 Methods Used to Determine Changes in Risk

Fire Risk Evaluations (FREs) were performed for Variances from Deterministic Requirements (VFDRs) of the DBNPS. This involves identifying the variations, then assessing the risk, and documenting the results on a per compartment basis. Below is a high level description of how the assessments were performed.

Variances from Deterministic Requirements at DBNPS were categorized into Nuclear Safety Performance Criteria (NSPC), including Reactor Coolant System (RCS) Inventory and Pressure Control, Decay Heat Removal (DHR), Reactivity Control, Process Monitoring, and Vital Auxiliaries. These challenges to the NSPC were then grouped by the PRA into Safety Functions which include Secondary Side Decay Heat Removal (VFDRs that are related to removing heat via the steam generator), Primary Side Integrity and Pressure Control (VFDRs related to RCS Inventory and Pressure Control), Support Systems (VFDRs related to power, cooling, etc. that may be relied upon for multiple systems), and Epsilon (VFDRs that are evaluated Qualitatively by the PRA).

The Safety Functions were then evaluated by removing the fire effects from the identified components (random failures were considered). Each group was evaluated separately in the PRA Analysis Assessments, along with one integrated All case (this All case is reported in Table W-3 under the heading "Compliant Case").

Table W-3 provides the risk increases and decreases on a fire compartment basis associated with VFDRs.

As allowed by RG 1.205, credit for alternative modifications (that do not bring fire compartments into compliance) but affect the FPRA results also have been considered to offset the risk increase. Specifically these alternative modifications include the installation of an Emergency Feedwater system to provide a new independent source of Feedwater to the Steam Generators, as well as FLEX RCS pumps. It is important to note that the risk reduction is based solely on the scope of fire initiating events.

<u>Calculating Delta Risk</u>

In order to calculate the total risk of the compartment three models are required:

1) The Current As-Built As-Operated Plant Model (R3)
2) The Compliant Case Model (R4)
3) The Transitioning Plant Model (R1).

The R3, or Base Model does not include any credit for the potential plant modifications identified in Attachment S.

The R4, or Compliant Case model starts with the As-Built As-Operated plant and takes all the equipment identified in all of the VFDRs, identified for the compartment, and removes the potential impact on the equipment due to fire. This may not be physically feasible, but from the risk analysis the equipment is protected and removed from every fire scenario located in the compartment. If an operator manual action was credited in the compartment, for compliance the operator action was set to false to simulate the operator performing this function flawlessly every time.

Note: In order to model the compliant case for the Main Control Room (FF-01), the process above was followed. In addition to the compliant case, the R4 model includes setting the contribution from control room abandonment due to loss of habitability to zero. By doing so, the compliant case essentially removes the need for abandonment.

The R1, or Transitioning Plant, model credits the proposed modifications in Attachment S. The two modifications of interest that reduce risk by the largest amount are the new independent train of Emergency Feedwater and the addition of two RCS Flex Charging Pumps. The Transitioning Plant Model credits modifications beyond compliance, whereas the compliant case (R4) does not.

In order to find the Fire Risk Evaluation (FRE) delta CDF and delta LERF it is the subtraction of the Fully Compliant Plant (R4) from the As-Built As-Operated plant (R3), which is included in Table W-2. Per RG 1.205 crediting the modifications that do not bring the compartment into compliance is allowed and is termed Risk Offset. That was calculated by taking the Transitioning model (which includes the modifications, R1) and subtracting the As-Built As-Operated plant (R3). This too is listed in Table W-2. Finally, the compartment Net Delta Risk is the addition of the FRE delta risk and the Risk Offset, which mathematically looks like the following:

$$(R3 - R4) + (R1 - R3) = R1 - R4 \, .$$

The compartment Net Delta Risk of the Transitioning Plant minus the Compliant Plant and is reported in Table W-2 on a per compartment basis.

The NFPA 805 transition risk based on the transitioning plant model meets RG 1.174 criteria for both CDF and LERF on a fire area by area and plant basis.

W.2.2 Risk Acceptance Criteria

As a result of transitioning to NFPA 805, plant modifications proposed for DBNPS result in a net decrease in both CDF and LERF. The total plant fire risk (including all internal and external events) is below 1E-04 for CDF and 1E-05 for LERF. Therefore, these changes meet the RG 1.174 acceptance guidelines.

RG 1.205 also requires the licensee to calculate the additional risk of recovery actions. The development of the FREs and data for Table W-3 treated all previously-approved operator manual actions as new. Thus, the ΔCDF and ΔLERF for all operator manual actions are included in the FRE results presented in Table W-3.

The total calculated Fire CDF and LERF (Post NFPA 805) using FRANX, which includes plant modifications proposed in Attachment S, are 3.98E-05/year and 1.17E-06/year, respectively.

As shown in Table W-3, safety was improved beyond the level of a compliant plant as a result of risk-informed modifications.

W.3 Generic RAI Resolutions

As a result of the industry going through interactions with the NRC and learning from our peers, the DBNPS PRA team included this section to provide the NRC information to help expedite the review process and help issue the DBNPS Safety Evaluation more efficiently.

W.3.1 State of Knowledge Correlation (SOKC)

The risk metrics in this attachment are presented in the form of point estimate values. The mean values of CDF and LERF estimated from the uncertainty analysis are expected to be slightly higher than the point estimates calculated using the input parameter mean values, depending on the degree to which the input parameters are correlated. The purpose of the uncertainty analysis was to demonstrate the difference between the point estimate and the mean values of the risk results. In the mean estimate analysis, mean values are used for each parameter in the following equations:

$$CDF = \sum\lambda * \sum(SF*Pns) * CCDP$$

$$LERF = \sum\lambda * \sum(SF*Pns) * CLERP$$

Where

λ = Scenario ignition frequency

SF*Pns = Probability of scenario fire induced damage state

CCDP = Scenario Conditional Core Damage Probability

CLERP = Scenario Conditional Large Early Release Probability

The summations are performed over all scenario damage states to derive the overall mean CDF and LERF for the plant.

In the uncertainty analysis, the terms in the above expressions are replaced by probability distributions representing the uncertainty in each term. Since the mean value is only affected by State of Knowledge Correlation (SOKC) of the probabilities of the basic events appearing in the same cutset (NUREG-1855, Vol. 1), the ignition frequency, weighting factor, and probability of non-suppression, from the equation above are considered independent. In this way, the only term affected by SOKC is CCDP or CLERP for a given fire scenario.

Uncertainty in the fire-induced CCDP and CLERP SOKC can be attributed to uncertainty in component failure rates and human error probabilities. The uncertainty analysis was performed using the Monte Carlo function of the UNCERT software. The method used in UNCERT samples all parametric distributions in the model and applies each sample value of each parameter to all basic events with the same parameter. The process is repeated thousands of times to obtain a sufficient number of sample values to develop the distributions for the fire induced CDF and LERF. This method, therefore, considers SOKC.

Below is the table of results from the evaluation:

CDF/yr 100,000 Samples (Monte Carlo)			
	5%	Median	95%
Point Est		3.98E-05	
Mean	3.90E-05	3.97E-05	4.00E-05
5%	1.00E-05	1.05E-05	1.10E-05
Median	2.70E-05	2.76E-05	2.80E-05
95%	1.00E-04	1.04E-04	1.10E-04

LERF/yr 100,000 Samples (Monte Carlo)			
	5%	Median	95%
Point Est		1.18E-06	
Mean	1.20E-06	1.18E-06	1.20E-06
5%	2.90E-07	2.97E-07	3.00E-07
Median	8.00E-07	8.07E-07	8.10E-07
95%	3.10E-06	3.12E-06	3.20E-06

The results of the uncertainty analysis provide reasonable confidence that the SOKC would have minimal effect on the results and, therefore, do not need to be explicitly accounted for in the quantification.

W.3.2 Unapproved Methods (UAMs)

DBNPS did not use any deviations from NRC Accepted Fire PRA Methods (e.g., NUREG/CR-6850, Frequently Asked Questions (FAQs), or Interim Guidance).

W.3.3 Control Power Transformers (CPT) and Spurious Event Probabilities

The DBNPS Circuit Failure Mode Likelihood Analysis used NUREG/CR-6850 Option 1 to determine spurious event probabilities. Since the publication of NUREG/CR-6850, the credit for the Control Power Transformer (CPT) credit has been removed as discussed in NUREG/CR-7150; therefore, the likelihood analysis was updated to remove the CPT credit, and as such, it was removed from the Fire PRA. NUREG/CR-6850 without the CPT credit was used for the Circuit Failure Model and Likelihood Analysis.

The duration factor was not applied to the spurious event probabilities. It is recognized that this may be a model enhancement in the future, but for now, the assessment is bounding by not including the additional reduction factor.

W.3.4 Transient Fire Pinch Points / Placement

Transient fires have been postulated in each fire compartment in the fire PRA. Accessible floor area is postulated as a possible transient ignition source location. Each fire compartment has been subdivided into one or more transient fire zones (weighted by floor area) to refine the frequency of damage to risk significant targets. The total transient frequency for each compartment is apportioned throughout the accessible floor area. A “pinch point” focused approach is not utilized at DBNPS. By analyzing transient fires for accessible floor areas within fire compartments, potential pinch point locations were considered for damage.

IGN-A9 was assessed a met CC I-III with a suggestion to document interviews with Maintenance and operations. Those interviews were then provided in the Ignition Frequency Calculation C-FP-013.10-008.

FSS-A5 was assessed a met CC III with no suggestions or findings.

W.3.5 Hotwork Cable Fires and Junction Box Fires

As described in Fire PRA Notebook 10-02 Plant Response Model, FAQ 13-0005 and FAQ 13-0006 were followed to determine how to apply the ignition frequency for Cable Fires Caused by Welding and Cutting and Junction Box fires when detailed fire modeling was performed. On a per compartment basis, only the highest CCDP raceway and junction box were applied (i.e., no subsequent screening was done as suggested in FAQ 13-0005 and FAQ 13-006, Step 3) if an ignition frequency was calculated for Bin 5, 11, 18, or 31.

W.3.6 Ignition Frequency Sensitivity

The DBNPS Fire PRA did not use NUREG/CR-6850 Supplement 1 data; instead, the DBNPS Fire PRA model was built using the NUREG-2169, published January 2015. It was determined that a sensitivity study comparing the frequencies from NUREG/CR-6850 and NUREG-2169 was unnecessary and, therefore, was not performed.

W.3.7 Main Control Room Abandonment

Main Control Room Abandonment CDF and LERF were established by first evaluating if the control room needs to be evacuated based on habitability. If the MCR was found to be uninhabitable factors such as Ignition Frequency, Probability of Abandonment (as determined by the ignition source type and control room ventilation), the Fire Severity Factor, and CCDP (evaluated using a simplified fault tree model) were applied to come up with a CDF contribution. LERF uses the same factors with the addition of CCDP/CLERP ratio. This ratio provides the additional failures of containment or phenomenological effects that lead to release of radionuclides provided core damage has occurred.

Note: The simplified fault tree includes feedwater through the Auxiliary Feedwater (AFW) system, the Motor Driven Feed Pump (MDFP), or the Emergency Feedwater (EFW) system, all of which can be operated from outside the Main Control Room. In addition to having decay heat removal, consideration of Reactor Coolant System Integrity maintained is considered. If feedwater is available and the RCS remains intact, then core damage can be avoided.

FSS-B1 was assessed as a met to CCI-III with a suggestion to discuss the factors applied to the HEPs of 5 or 10 based on non-severe or severe fire. That discussion has been added to the Fire HRA notebook since the peer review.

FSS-B2 was assessed as met to CC III with no suggestions or findings.

W.3.8 Wrapped or Embedded Cables

If the cable protection is less than 3-hour by wrap or embedment, or a 1-hour embedment with validation of fire duration, the cable is included in the Level 1 Failure Reports, and its support function is considered failed when the fire damages the cable. Those failures are included in the DBNPS Fire PRA.

W.3.9 Peer Review PRA Upgrades

Since the PRA Peer Review of internal events and fire, DBNPS has implemented no PRA upgrades, which are defined in NOBP-CC-6001 as, “The incorporation into a PRA model of a new methodology or change in scope or new capability as defined by RG 1.200. For example, this could include items such as new human error analysis methodology, new data update methods, new approaches to quantification or truncation, or new treatment of common cause failure."

W.3.10 Fire Propagation for Well Sealed Electrical Cabinets

Well-sealed electrical cabinets > 440V were being treated to have a probability that the fire could cause an arc fault that opens the cabinet and spreads to the closest raceway. In order to reduce the amount of work to implement the FAQ, the following methodology was followed:

1. If the compartment CCDP times the fraction of MCC fires energetic enough to breach the well-sealed MCC enclosure is < 1E-08, then the scenario is mapped to whole room damage (WRD).
2. If the compartment CCDP times the fraction of MCC fires energetic enough to breach the well-sealed MCC enclosure is between 1E-08 and 5E-07, then specific measurements from the field walkdowns are used to determine the fraction of MCC fires that damage targets above the well-sealed MCC based on fire modeling and to determine the severity factors but still map to whole room damage.
3. If the compartment CCDP times the fraction of MCC fires energetic enough to breach the well-sealed MCC enclosure is > 5E-07, specific measurements from the walkdowns are used to determine the fraction of MCC fires that damage targets above the well-sealed MCC based on fire modeling and to determine the severity factor and map these scenarios to specific scenarios damaging only targets within the zone of influence.

   The method chosen is in compliance with FAQ 14-0009.

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
P-03.T03	TS#3 N/A	8.41%	TBU/ AD210, FV6452, and LTSP9A3 result in failure of the Motor Driven Feed Pump (MDFP), flow from Auxiliary Feedwater Pump (AFP) 1 and flow from AFP 2 Make Up (MU) is failed due to impacts on the Make Up Pump (MUP) Breakers AC105 and AD105.	2.72E-04	8.63E-01	1.00E+00	8.50E-01	2.00E-04	2.58E-02	6.05E-06	8.41%
Q-01.10B	D1_EA (HEAF) FDS1/2/5/6	6.77%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a Steam Generator (SG) overfill which puts water in the steam lines thus failing the Auxiliary Feed Pump Turbines (AFPTs). Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the Power Operated Relief Valve (PORV). Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use Low Pressure Injection (LPI).	2.83E-04	9.96E-01	1.00E+00	5.72E-01	1.61E-04	1.95E-02	5.48E-06	15.18%
A-08.T09	TS#9 N/A	4.09%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater High Pressure Injection (HPI) is required to cool down however HPI is failed due to fire impacts on BE11E and power failures to BF11E.	2.72E-04	6.89E-01	1.00E+00	5.19E-01	9.73E-05	1.60E-02	2.99E-06	19.28%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.07B	Bus B FDS1/2/6	3.79%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.69E-04	3.34E-01	1.00E+00	5.75E-01	9.01E-05	1.95E-02	3.06E-06	23.07%
Q-01.09D	D1_EA FDS4/5/8/9/10	3.74%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	3.55E-01	1.00E+00	5.75E-01	8.90E-05	1.96E-02	3.03E-06	26.81%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.11B	D2_EA FDS1/2/6	3.74%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	3.54E-01	1.00E+00	5.75E-01	8.88E-05	1.95E-02	3.01E-06	30.54%
Q-01.07D	Bus B FDS4/5/8/9/10	3.68%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.69E-04	3.25E-01	1.00E+00	5.75E-01	8.76E-05	1.95E-02	2.97E-06	34.23%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.09B	D1_EA FDS1/2/6	3.06%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	2.90E-01	1.00E+00	5.75E-01	7.27E-05	1.96E-02	2.47E-06	37.29%
S-01.10B	Bus A (HEAF) FDS1/2/5/6	2.95%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 Containment Air Coolers (CACs). Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	2.83E-04	9.96E-01	1.00E+00	2.49E-01	7.02E-05	8.22E-03	2.31E-06	40.24%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
S-01.12B	C1_41 (HEAF) FDS1/2/5/6	2.94%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	2.83E-04	9.96E-01	1.00E+00	2.49E-01	7.00E-05	8.19E-03	2.31E-06	43.18%
Q-01.11A	D2_EA FDS0	2.75%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	4.36E-04	2.84E-01	1.00E+00	5.29E-01	6.55E-05	1.65E-02	2.04E-06	45.94%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.11D	D2_EA FDS4/5/8/9/10	2.74%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	2.60E-01	1.00E+00	5.75E-01	6.52E-05	1.95E-02	2.21E-06	48.68%
S-01.14B	C2_EA (HEAF) FDS1/2/5/6	2.73%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	2.61E-04	9.96E-01	1.00E+00	2.49E-01	6.48E-05	8.22E-03	2.14E-06	51.41%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
S-01.11C	C1_41 FDS3/4/7/8	2.61%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	4.36E-04	5.72E-01	1.00E+00	2.49E-01	6.21E-05	8.22E-03	2.05E-06	54.02%
S-01.09C	Bus A FDS3/4/7/8	2.59%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	4.36E-04	5.66E-01	1.00E+00	2.49E-01	6.15E-05	8.22E-03	2.03E-06	56.61%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
DD-01.HOTWORK CABLEFIRE	Bin 5 DD-01 CABLE FIRE CAUSED BY WELDING AND CUTTING	2.32%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down long term is through transferring from the BWST to the sump. Fire impacts on L511 and L513 prevent the SFAS signal thus inhibiting the ability to transfer to the sump.	1.03E-04	1.00E+00	1.00E+00	5.35E-01	5.51E-05	1.94E-02	2.00E-06	58.92%
Q-01.08B	Bus B (HEAF) FDS1/2/5/6	1.69%	TBLX/ AF3870 fails to remain open thus failing feedwater to SG1. Failures of LTSP9A3 and FV6451 prevent flow from feedwater from AFP 2 resulting in a loss of flow of feedwater from both AFPs. Note: Because this is a HEAF on Bus B the MDFP never had power to spuriously start and therefore AD210-P is not a concern for this scenario. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	3.04E-04	9.96E-01	1.00E+00	1.32E-01	4.02E-05	4.07E-03	1.23E-06	60.61%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
A-08.11B	P170-1 FDS1/2/4/7	1.62%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater HPI is required to cool down however HPI is failed due to fire impacts on BE11E and power failures to BF11E.	2.29E-04	3.24E-01	1.00E+00	5.19E-01	3.84E-05	1.60E-02	1.18E-06	62.23%
A-08.12B	P170-2 FDS1/2/4/7	1.62%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater HPI is required to cool down however HPI is failed due to fire impacts on BE11E and power failures to BF11E.	2.29E-04	3.24E-01	1.00E+00	5.19E-01	3.84E-05	1.60E-02	1.18E-06	63.84%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.12B	D2_EA (HEAF) FDS1/2/5/6	1.57%	TBLX/ AF3870 fails to remain open thus failing feedwater to SG1. Failures of LTSP9A3 and FV6451 prevent flow from feedwater from AFP 2 resulting in a loss of flow of feedwater from both AFPs. Note: Because this is a HEAF on Bus D2_EA the MDFP never had power to spuriously start and therefore AD210-P is not a concern for this scenario. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	2.83E-04	9.96E-01	1.00E+00	1.32E-01	3.73E-05	4.07E-03	1.14E-06	65.41%
II-03.COMPARTMENT-II-01	MCA Scenario Impacting II-03, II-01	1.47%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment Room 429 ventilation, resulting in a loss of power to CAC 1-1 and CAC 1-3, causing an environment unsuitable for the PORV to function.	2.39E-03	1.00E+00	3.58E-01	4.10E-02	3.50E-05	1.27E-03	1.08E-06	66.89%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
S-01.13B	C2_EA FDS1/2/6	1.45%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	4.02E-04	3.44E-01	1.00E+00	2.49E-01	3.44E-05	8.21E-03	1.13E-06	68.33%
Q-01.11C	D2_EA FDS3/7	1.07%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	1.02E-01	1.00E+00	5.75E-01	2.54E-05	1.95E-02	8.63E-07	69.40%

Table W-1 Significant Fire Initiating Events Contributing Greater than 1% (~70% of the Calculated CDF for the As-Built Plant)

Scenario	Desc	% Contribution	Risk Insights (Dominant Sequence)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
S-01.13D	C2_EA FDS4/5/8/9	1.01%	TBLX/ AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	4.02E-04	2.39E-01	1.00E+00	2.49E-01	2.40E-05	8.20E-03	7.90E-07	70.41%

Table W-2 presents the Transitioning Plant top scenarios that contribute greater than 1% to CDF.

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
A-08.T09	TS#9 N/A	7.12%	TBLX/ TBU Fire Impacts on FT6427 fail the automatic initiation of EFW. Once the automatic initiation fails operators are required to manually initiate the EFW system. In this sequence operators fail to initiate EFW. In addition, random failures of the EFW system contribute to the overall risk. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater HPI is required to cool down however HPI is failed due to fire impacts on BE11E and power failures to BF11E.	2.72E-04	6.89E-01	1.00E+00	1.51E-02	2.83E-06	4.66E-04	8.73E-08	7.12%
P-03.T03	TS#3 N/A	5.54%	TBU/ Random failures of the EFW system. AD210, FV6452, and LTSP9A3 result in failure of the MDFP, flow from AFP 1 and flow from AFP 2. MU is failed due to impacts on MUP Breakers AC105 and AD105.	2.72E-04	8.63E-01	1.00E+00	9.40E-03	2.21E-06	2.84E-04	6.66E-08	12.66%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.10B	D1_EA (HEAF) FDS1/2/5/6	5.05%	TBLX/ Random failures of the EFW system. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	2.83E-04	9.96E-01	1.00E+00	7.14E-03	2.01E-06	2.17E-04	6.10E-08	17.70%
Q-01.07B	Bus B FDS1/2/6	2.82%	TBLX/ Random failures of the EFW system. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.69E-04	3.34E-01	1.00E+00	7.16E-03	1.12E-06	2.17E-04	3.40E-08	20.52%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
A-08.11B	P170-1 FDS1/2/4/7	2.80%	TBLX/ TBU Fire Impacts on FT6427 fail the automatic initiation of EFW. Once the automatic initiation fails operators are required to manually initiate the EFW system. In this sequence operators fail to initiate EFW. In addition, random failures of the EFW system contribute to the overall risk. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater HPI is required to cool down however HPI is failed due to fire impacts on BE11E and power failures to BF11E.	2.29E-04	3.24E-01	1.00E+00	1.51E-02	1.12E-06	4.64E-04	3.43E-08	23.32%
A-08.12B	P170-2 FDS1/2/4/7	2.80%	TBLX/ TBU Fire Impacts on FT6427 fail the automatic initiation of EFW. Once the automatic initiation fails operators are required to manually initiate the EFW system. In this sequence operators fail to initiate EFW. In addition, random failures of the EFW system contribute to the overall risk. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater HPI is required to cool down however HPI is failed due to fire impacts on BE11E and power failures to BF11E.	2.29E-04	3.24E-01	1.00E+00	1.51E-02	1.12E-06	4.64E-04	3.43E-08	26.13%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.09D	D1_EA FDS4/5/8/9/10	2.78%	TBLX/ Random failures of the EFW system. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	3.55E-01	1.00E+00	7.16E-03	1.11E-06	2.17E-04	3.36E-08	28.91%
Q-01.11B	D2_EA FDS1/2/6	2.78%	TBLX/ Random failures of the EFW system. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	3.54E-01	1.00E+00	7.16E-03	1.11E-06	2.17E-04	3.35E-08	31.69%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.07D	Bus B FDS4/5/8/9/10	2.74%	TBLX/ Random failures of the EFW system. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.69E-04	3.25E-01	1.00E+00	7.16E-03	1.09E-06	2.17E-04	3.30E-08	34.43%
FF-01.MCRABANDON	Abandonment of the MCR	2.65%	This scenario is from the Main Control Room Analysis. It is the summation of all scenarios leading to abandonment. CDF is comprised of the ignition frequency, severity factor, probability of abandonment, CCDP. LERF is comprised of ignition frequency, severity factor, probability of abandonment, CCDP, CLERP/CCDP ratio. See the Main Control Room Analysis for details.					1.05E-06		2.07E-08	37.07%
Q-01.09B	D1_EA FDS1/2/6	2.27%	TBLX/ Random failures of the EFW system. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	2.90E-01	1.00E+00	7.15E-03	9.04E-07	2.17E-04	2.74E-08	39.34%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.11D	D2_EA FDS4/5/8/9/10	2.03%	TBLX/ Random failures of the EFW system. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	2.60E-01	1.00E+00	7.14E-03	8.10E-07	2.16E-04	2.45E-08	41.38%
S-01.10B	Bus A (HEAF) FDS1/2/5/6	2.03%	TBLX/ Radom failures of the EFW System. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	2.83E-04	9.96E-01	1.00E+00	2.88E-03	8.10E-07	8.89E-05	2.50E-08	43.41%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
S-01.12B	C1_41 (HEAF) FDS1/2/5/6	2.03%	TBLX/ Radom failures of the EFW System. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	2.83E-04	9.96E-01	1.00E+00	2.87E-03	8.07E-07	8.87E-05	2.50E-08	45.43%
Q-01.11A	D2_EA FDS0	1.91%	TBLX/ Random failures of the EFW system. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	4.36E-04	2.84E-01	1.00E+00	6.16E-03	7.62E-07	1.86E-04	2.30E-08	47.35%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
S-01.14B	C2_EA (HEAF) FDS1/2/5/6	1.87%	TBLX/ Radom failures of the EFW System. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	2.61E-04	9.96E-01	1.00E+00	2.87E-03	7.46E-07	8.86E-05	2.30E-08	49.22%
S-01.11C	C1_41 FDS3/4/7/8	1.79%	TBLX/ Radom failures of the EFW System. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	4.36E-04	5.72E-01	1.00E+00	2.86E-03	7.14E-07	8.85E-05	2.21E-08	51.01%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
S-01.09C	Bus A FDS3/4/7/8	1.77%	TBLX/ Radom failures of the EFW System. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. During accident conditions in order for the PORV to remain functional it requires 2 CACs. Fire impacts equipment required to supply power to CAC 1-1 and following an interruption in power to CAC 1-3 SW1368 fails to open resulting in a loss of CAC 1-3 and an environment suitable for the PORV to function.	4.36E-04	5.66E-01	1.00E+00	2.86E-03	7.06E-07	8.85E-05	2.18E-08	52.79%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
DD-01.HOTWORK CABLEFIRE	Bin 5 DD-01 CABLE FIRE CAUSED BY WELDING AND CUTTING	1.74%	TBLX/ Raceway BCPC45 in compartment DD-01 is impacted due to hot work. Radom failures of the EFW System. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater the only way to cool down is through the use of the PORV. In order to inject water into the RCS long into the event one High Pressure Injection Pumps running in recirculation (HPR) mode must succeed. HPR Train 1 fails due to fire impacts on SFAS Logic Modules L511 and L513 resulting in a failure of the SFAS Signal to switch to the Emergency Sump. HPR Train 2 is lost similarly due to fire impacts on SFAS Logic Modules L512 and L514 resulting in a failure of the SFAS Signal to switch to the Emergency sump.	1.03E-04	1.00E+00	1.00E+00	6.73E-03	6.92E-07	2.34E-04	2.40E-08	54.52%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
EE-01.T10	TS#10 N/A	1.42%	TBU/ Operations fail to manually start the EFW system. The manual initiation is required due to fire impacts on MS101 failing to close resulting in a depressurized SG. If the sensors believe the SG is depressurized it will not automatically feed the steam generator. MS106, MS106A, MS107, MS107A all fail closed resulting in no steam flow to the AFPTs. Without steam the AFW system fails. The MDFP is failed due to operations failing to align it or other random failures. Once feedwater is lost early coolant injection will be required. This can be done through the HPI pumps or the MUPs, however operator actions are required. In these sequences operators either fail to initiate the second MU Pump or HPI Cooling or the succeed at initiating the second pump but do not go and open the MUP Room door to maintain a suitable environment for the MUPs to function given the normal room cooling is failed. Normal ventilation is failed because it is powered from a non-essential load and the cable to support the power supply is un-located.	2.86E-04	9.68E-01	1.00E+00	2.04E-03	5.64E-07	5.59E-05	1.55E-08	55.94%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
Q-01.08B	Bus B (HEAF) FDS1/2/5/6	1.19%	TBLX/ Random failures of the EFW system. AF3870 fails to remain open thus failing feedwater to SG1. Failures of LTSP9A3 and FV6451 prevent flow from feedwater from AFP 2 resulting in a loss of flow of feedwater from both AFPs. Note: Because this is a HEAF on Bus B the MDFP never had power to spuriously start and therefore AD210-P is not a concern for this scenario. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	3.04E-04	9.96E-01	1.00E+00	1.56E-03	4.72E-07	4.61E-05	1.40E-08	57.12%
A-08.01B	C62-1 FDS2/3/4/5/7/8 /9/10/11	1.18%	TBLX/ TBU Fire Impacts on FT6427 fail the automatic initiation of EFW. Once the automatic initiation fails operators are required to manually initiate the EFW system. In this sequence operators fail to initiate EFW. In addition, random failures of the EFW system contribute to the overall risk. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater HPI is required to cool down however HPI is failed due to fire impacts on BE11E and power failures to BF11E.	3.88E-04	8.07E-02	1.00E+00	1.50E-02	4.70E-07	4.62E-04	1.45E-08	58.30%

Table W-2 Significant Fire Initiating Events Contributing Greater than 1% (~60% of the Calculated CDF for the Transition Plant)

Scenario	Scenario Description	% Contribution	Risk Insights (Dominant Sequences)/ Key Failures	IGF	SF	Pbf	CCDP	CDF	CLERP	LERF	Cumulative CDF % Contribution
A-08.10B	RC3717/RC3718 FDS2/3/4/5/7/8/9/10/11	1.11%	TBLX/ TBU Fire Impacts on FT6427 fail the automatic initiation of EFW. Once the automatic initiation fails operators are required to manually initiate the EFW system. In this sequence operators fail to initiate EFW. In addition, random failures of the EFW system contribute to the overall risk. AD210-P spuriously closes resulting in a spurious start of the MDFP causing a SG overfill which puts water in the steam lines thus failing the AFPTs. Then the fire clears and the MDFP is failed resulting in a loss of feedwater. With the loss of feedwater HPI is required to cool down however HPI is failed due to fire impacts on BE11E and power failures to BF11E.	3.35E-05	8.81E-01	1.00E+00	1.50E-02	4.43E-07	4.62E-04	1.36E-08	59.42%
Q-01.12B	D2_EA (HEAF) FDS1/2/5/6	1.10%	TBLX/ Random failures of the EFW system. AF3870 fails to remain open thus failing feedwater to SG1. Failures of LTSP9A3 and FV6451 prevent flow from feedwater from AFP 2 resulting in a loss of flow of feedwater from both AFPs. Note: Because this is a HEAF on Bus B the MDFP never had power to spuriously start and therefore AD210-P is not a concern for this scenario. With the loss of Feedwater the only way to cool down is through the use of the PORV. Fire failures of power to F1 results in a loss of battery D2N. This loss of battery prevents manual control to open the PORV in order to cool down and use LPI.	2.83E-04	9.96E-01	1.00E+00	1.55E-03	4.38E-07	4.61E-05	1.30E-08	60.52%

Table W-3 Davis-Besse Fire Compartment Risk Summary[1]

		Transitioning Plant		Current As-Built Plant		All VFDRs Fixed		Excluding Risk Offset				Net Delta			
		R1[4]		R3[4]		R4[2]		FRE Delta Risk (R3-R4)		Risk Offset (R1-R3)		Net Delta (R1-R4)		Additional Risk of RAs[3]	
Fire Compartment	Description	CDF (R1)	LERF (R1)	CDF (R3)	LERF (R3)	CDF (R4)	LERF (R4)	Delta ALL CDF (R3-R4)	Delta ALL LERF (R3-R4)	Roff CDF	Roff LERF	Net CDF	Net LERF	CDF	LERF
A-01	Spent Resin, Decon & Storage	6.46E-09	9.01E-11	8.49E-08	2.19E-09	0.00E+00	0.00E+00	8.49E-08	2.19E-09	-7.84E-08	-2.10E-09	6.46E-09	9.01E-11	6.46E-09	9.01E-11
A-02	545	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
A-03	Misc. Waste Monitoring Tank Rm	9.40E-09	3.02E-10	2.43E-07	7.59E-09	0.00E+00	0.00E+00	2.43E-07	7.59E-09	-2.34E-07	-7.29E-09	9.40E-09	3.02E-10	9.40E-09	3.02E-10
A-04	ECCS 2	7.08E-08	2.33E-09	1.55E-06	3.79E-08	0.00E+00	0.00E+00	1.55E-06	3.79E-08	-1.48E-06	-3.56E-08	7.08E-08	2.33E-09	7.08E-08	2.33E-09
A-05	CWRT	4.58E-07	8.34E-09	1.01E-05	3.36E-07	0.00E+00	0.00E+00	1.01E-05	3.36E-07	-9.64E-06	-3.28E-07	4.58E-07	8.34E-09	4.58E-07	8.34E-09
A-06	Containment Annulus (east)	3.20E-09	7.59E-11	3.15E-08	8.81E-10	0.00E+00	0.00E+00	3.15E-08	8.81E-10	-2.83E-08	-8.05E-10	3.20E-09	7.59E-11	3.20E-09	7.59E-11
A-07	#2 MPR	9.35E-10	3.28E-11	3.27E-08	8.74E-10	0.00E+00	0.00E+00	3.27E-08	8.74E-10	-3.18E-08	-8.41E-10	9.35E-10	3.28E-11	9.35E-10	3.28E-11
A-08	#4 MPR	8.86E-06	2.72E-07	3.14E-04	9.63E-06	1.60E-05	4.83E-07	2.98E-04	9.15E-06	-3.05E-04	-9.36E-06	-7.14E-06	-2.11E-07	2.98E-04	9.15E-06
A-09	Cable Chase	1.91E-08	6.26E-10	1.75E-06	5.39E-08	0.00E+00	0.00E+00	1.75E-06	5.39E-08	-1.73E-06	-5.33E-08	1.91E-08	6.26E-10	1.91E-08	6.26E-10
AB-01	ECCS 1	8.54E-08	1.78E-09	2.06E-06	3.95E-08	0.00E+00	0.00E+00	2.06E-06	3.95E-08	-1.97E-06	-3.77E-08	8.54E-08	1.78E-09	8.54E-08	1.78E-09
AB-02	Containment Annulus (west)	5.32E-08	1.62E-09	5.82E-08	1.92E-09	0.00E+00	0.00E+00	5.82E-08	1.92E-09	-5.00E-09	-3.00E-10	5.32E-08	1.62E-09	5.32E-08	1.62E-09
AB-03	#1 MPR	4.57E-08	9.48E-11	1.03E-06	1.57E-09	0.00E+00	0.00E+00	1.03E-06	1.57E-09	-9.84E-07	-1.48E-09	4.57E-08	9.48E-11	4.57E-08	9.48E-11
AB-04	MU Pump RM	5.52E-07	7.40E-09	3.85E-05	2.85E-07	9.16E-07	3.02E-08	3.76E-05	2.55E-07	-3.79E-05	-2.78E-07	-3.64E-07	-2.28E-08	3.76E-05	2.55E-07
AB-05	#3 MPR	1.74E-08	3.99E-10	7.39E-07	3.11E-09	0.00E+00	0.00E+00	7.39E-07	3.11E-09	-7.22E-07	-2.71E-09	1.74E-08	3.99E-10	1.74E-08	3.99E-10
AB-06	Aux Bldg Stairwell 3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
AC-01	BWST and PWST Pipe Trench	7.93E-10	3.36E-11	4.13E-09	3.36E-11	0.00E+00	0.00E+00	4.13E-09	3.36E-11	-3.34E-09	0.00E+00	7.93E-10	3.36E-11	7.93E-10	3.36E-11
AD-01	Aux Bldg Elev equip room	0.00E+00	1.03E-12	0.00E+00	3.72E-12	0.00E+00	0.00E+00	0.00E+00	3.72E-12	0.00E+00	-2.69E-12	0.00E+00	1.03E-12	0.00E+00	1.03E-12
B-01	Pipe Chase	2.89E-10	0.00E+00	2.89E-10	1.40E-12	0.00E+00	0.00E+00	2.89E-10	1.40E-12	0.00E+00	-1.40E-12	2.89E-10	0.00E+00	2.89E-10	0.00E+00
BD-01	Screenwash Pump & Diesel FP day tank	1.53E-10	1.22E-11	8.93E-10	4.52E-11	0.00E+00	0.00E+00	8.93E-10	4.52E-11	-7.40E-10	-3.30E-11	1.53E-10	1.22E-11	1.53E-10	1.22E-11
BE-01	Diesel Fire Pump Rm	1.03E-10	1.18E-11	2.07E-08	6.67E-10	0.00E+00	0.00E+00	2.07E-08	6.67E-10	-2.06E-08	-6.55E-10	1.03E-10	1.18E-11	1.03E-10	1.18E-11
BF-01	SWP RM	0.00E+00	0.00E+00	2.57E-08	7.96E-10	0.00E+00	0.00E+00	2.57E-08	7.96E-10	-2.57E-08	-7.96E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BG-01	SW VALVE	0.00E+00	0.00E+00	2.72E-08	9.61E-10	0.00E+00	0.00E+00	2.72E-08	9.61E-10	-2.72E-08	-9.61E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table W-3 Davis-Besse Fire Compartment Risk Summary[1]

		Transitioning Plant		Current As-Built Plant		All VFDRs Fixed		Excluding Risk Offset				Net Delta			
		R1[4]		R3[4]		R4[2]		FRE Delta Risk (R3-R4)		Risk Offset (R1-R3)		Net Delta (R1-R4)		Additional Risk of RAs[3]	
Fire Compartment	Description	CDF (R1)	LERF (R1)	CDF (R3)	LERF (R3)	CDF (R4)	LERF (R4)	Delta ALL CDF (R3-R4)	Delta ALL LERF (R3-R4)	Roff CDF	Roff LERF	Net CDF	Net LERF	CDF	LERF
BH-01	Labs	1.08E-09	2.92E-11	3.69E-08	1.39E-09	0.00E+00	0.00E+00	3.69E-08	1.39E-09	-3.58E-08	-1.36E-09	1.08E-09	2.92E-11	1.08E-09	2.92E-11
BM-01	Diesel Oil Pumphouse	0.00E+00	1.99E-12	0.00E+00	1.16E-11	0.00E+00	0.00E+00	0.00E+00	1.16E-11	0.00E+00	-9.61E-12	0.00E+00	1.99E-12	0.00E+00	1.99E-12
BN-01	EDG Week Tanks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CC-01	Labs	1.54E-09	3.12E-11	1.33E-07	6.36E-10	0.00E+00	0.00E+00	1.33E-07	6.36E-10	-1.31E-07	-6.05E-10	1.54E-09	3.12E-11	1.54E-09	3.12E-11
D-01	Let Down Cooler & CF Tank Area	1.82E-07	4.86E-09	5.34E-07	1.57E-08	0.00E+00	0.00E+00	5.34E-07	1.57E-08	-3.52E-07	-1.08E-08	1.82E-07	4.86E-09	1.82E-07	4.86E-09
DD-01	Cable Spread Rm	1.37E-06	4.96E-08	8.22E-05	2.96E-06	1.04E-05	3.44E-07	7.18E-05	2.62E-06	-8.08E-05	-2.91E-06	-9.03E-06	-2.94E-07	7.18E-05	2.62E-06
DF-01	#2 EPR	4.60E-07	1.45E-08	1.51E-06	5.07E-08	0.00E+00	0.00E+00	1.51E-06	5.07E-08	-1.05E-06	-3.62E-08	4.60E-07	1.45E-08	4.60E-07	1.45E-08
DG-01	#1 EPR	5.18E-09	0.00E+00	1.10E-06	3.79E-09	0.00E+00	0.00E+00	1.10E-06	3.79E-09	-1.09E-06	-3.79E-09	5.18E-09	0.00E+00	5.18E-09	0.00E+00
DH-01	#2 MS Line Area	5.66E-08	1.75E-09	7.43E-08	2.31E-09	0.00E+00	0.00E+00	7.43E-08	2.31E-09	-1.77E-08	-5.60E-10	5.66E-08	1.75E-09	5.66E-08	1.75E-09
E-01	AFP1 Rm	1.73E-08	3.85E-10	8.14E-07	2.72E-08	0.00E+00	0.00E+00	8.14E-07	2.72E-08	-7.97E-07	-2.68E-08	1.73E-08	3.85E-10	1.73E-08	3.85E-10
EE-01	FAN ALLEY	7.48E-07	2.06E-08	9.00E-07	2.53E-08	2.35E-10	7.40E-12	9.00E-07	2.53E-08	-1.52E-07	-4.70E-09	7.48E-07	2.06E-08	9.00E-07	2.53E-08
EF-01	EFWF	1.41E-09	7.28E-11	1.41E-09	7.28E-11	0.00E+00	0.00E+00	1.41E-09	7.28E-11	0.00E+00	0.00E+00	1.41E-09	7.28E-11	1.41E-09	7.28E-11
F-01	AFP2	7.12E-08	2.00E-09	4.55E-06	1.70E-07	0.00E+00	0.00E+00	4.55E-06	1.70E-07	-4.48E-06	-1.68E-07	7.12E-08	2.00E-09	7.12E-08	2.00E-09
FF-01	Main Control Room	1.46E-06	2.55E-08	1.05E-05	2.18E-07	0.00E+00	1.12E-11	1.05E-05	2.18E-07	-9.01E-06	-1.92E-07	1.46E-06	2.55E-08	1.05E-05	2.18E-07
FF-02	Storage	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FF-03	Control room kitchen	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G-01	CLW Monitoring Tank Room	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
G-02	565 EAST	2.82E-07	4.96E-09	9.37E-06	1.84E-07	0.00E+00	0.00E+00	9.37E-06	1.84E-07	-9.09E-06	-1.79E-07	2.82E-07	4.96E-09	2.82E-07	4.96E-09
G-03	SFP demin, valve room	0.00E+00	2.61E-12	6.89E-08	2.10E-10	0.00E+00	0.00E+00	6.89E-08	2.10E-10	-6.89E-08	-2.07E-10	0.00E+00	2.61E-12	0.00E+00	2.61E-12
HH-01	A/C EGMT RM	0.00E+00	0.00E+00	2.70E-10	1.97E-11	0.00E+00	0.00E+00	2.70E-10	1.97E-11	-2.70E-10	-1.97E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
II-01	TURB BLDG	2.79E-07	9.88E-09	3.29E-05	1.03E-06	0.00E+00	0.00E+00	3.29E-05	1.03E-06	-3.26E-05	-1.02E-06	2.79E-07	9.88E-09	2.79E-07	9.88E-09
II-02	Aux steam boiler room	5.47E-08	1.91E-09	6.19E-06	2.02E-07	0.00E+00	0.00E+00	6.19E-06	2.02E-07	-6.14E-06	-2.00E-07	5.47E-08	1.91E-09	5.47E-08	1.91E-09
II-03	Seal Oil Room	3.82E-07	1.19E-08	3.50E-05	1.08E-06	0.00E+00	0.00E+00	3.50E-05	1.08E-06	-3.46E-05	-1.07E-06	3.82E-07	1.19E-08	3.82E-07	1.19E-08
II-04	SAC #2, workshops	1.68E-09	6.90E-11	1.58E-07	4.93E-09	0.00E+00	0.00E+00	1.58E-07	4.93E-09	-1.56E-07	-4.86E-09	1.68E-09	6.90E-11	1.68E-09	6.90E-11

Table W-3 Davis-Besse Fire Compartment Risk Summary[1]

		Transitioning Plant		Current As-Built Plant		All VFDRs Fixed		Excluding Risk Offset				Net Delta			
		R1[4]		R3[4]		R4[2]		FRE Delta Risk (R3-R4)		Risk Offset (R1-R3)		Net Delta (R1-R4)		Additional Risk of RAs[3]	
Fire Compartment	Description	CDF (R1)	LERF (R1)	CDF (R3)	LERF (R3)	CDF (R4)	LERF (R4)	Delta ALL CDF (R3-R4)	Delta ALL LERF (R3-R4)	Roff CDF	Roff LERF	Net CDF	Net LERF	CDF	LERF
II-05	oil drum storage	0.00E+00	1.34E-12	0.00E+00	5.90E-12	0.00E+00	0.00E+00	0.00E+00	5.90E-12	0.00E+00	-4.56E-12	0.00E+00	1.34E-12	0.00E+00	1.34E-12
II-06	cond storage tank room	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
II-07	lube oil filter room	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
II-08	Turb Lub Oil Tank Room	1.70E-08	6.03E-10	2.01E-06	6.27E-08	0.00E+00	0.00E+00	2.01E-06	6.27E-08	-1.99E-06	-6.21E-08	1.70E-08	6.03E-10	1.70E-08	6.03E-10
II-09	non radwaste air equip room	1.96E-09	1.19E-11	2.68E-09	4.23E-11	0.00E+00	0.00E+00	2.68E-09	4.23E-11	-7.20E-10	-3.04E-11	1.96E-09	1.19E-11	1.96E-09	1.19E-11
J-01	EDG #2	6.50E-09	1.11E-10	1.25E-06	1.46E-08	0.00E+00	0.00E+00	1.25E-06	1.46E-08	-1.24E-06	-1.45E-08	6.50E-09	1.11E-10	6.50E-09	1.11E-10
J-02	Day tank 1-2 room	1.04E-08	3.59E-10	1.07E-06	3.59E-08	0.00E+00	0.00E+00	1.07E-06	3.59E-08	-1.06E-06	-3.55E-08	1.04E-08	3.59E-10	1.04E-08	3.59E-10
K-01	EDG #1	1.92E-07	6.28E-09	2.47E-06	8.38E-08	0.00E+00	0.00E+00	2.47E-06	8.38E-08	-2.28E-06	-7.75E-08	1.92E-07	6.28E-09	1.92E-07	6.28E-09
K-02	Day tank 1-1 room	2.69E-08	1.07E-09	1.84E-06	6.84E-08	0.00E+00	0.00E+00	1.84E-06	6.84E-08	-1.81E-06	-6.73E-08	2.69E-08	1.07E-09	2.69E-08	1.07E-09
MA-01	Manhole MH3001	1.08E-07	3.81E-09	5.87E-06	1.93E-07	0.00E+00	0.00E+00	5.87E-06	1.93E-07	-5.76E-06	-1.89E-07	1.08E-07	3.81E-09	1.08E-07	3.81E-09
MB-01	Manhole MH3004	0.00E+00	2.19E-11	1.98E-07	6.66E-09	0.00E+00	0.00E+00	1.98E-07	6.66E-09	-1.98E-07	-6.64E-09	0.00E+00	2.19E-11	0.00E+00	2.19E-11
MC-01	Manhole	2.00E-07	6.73E-09	2.00E-07	6.73E-09	0.00E+00	0.00E+00	2.00E-07	6.73E-09	0.00E+00	0.00E+00	2.00E-07	6.73E-09	2.00E-07	6.73E-09
ME-01	Manhole	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MF-01	Manhole	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MG-01	Manhole	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MH-01	Manhole	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OF-01	Office	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OS	OUTSIDE +MISC	1.82E-08	5.49E-10	1.83E-06	5.59E-08	0.00E+00	0.00E+00	1.83E-06	5.59E-08	-1.81E-06	-5.54E-08	1.82E-08	5.49E-10	1.82E-08	5.49E-10
P-01	Elect maint room	0.00E+00	0.00E+00	1.17E-10	1.79E-11	0.00E+00	0.00E+00	1.17E-10	1.79E-11	-1.17E-10	-1.79E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
P-02	Charging room	6.49E-08	2.14E-09	5.64E-06	1.86E-07	0.00E+00	0.00E+00	5.64E-06	1.86E-07	-5.58E-06	-1.84E-07	6.49E-08	2.14E-09	6.49E-08	2.14E-09
P-03	EDG PASSA	2.75E-06	8.29E-08	2.48E-04	7.53E-06	2.00E-04	6.04E-06	4.80E-05	1.49E-06	-2.45E-04	-7.45E-06	-1.97E-04	-5.96E-06	4.80E-05	1.49E-06
Q-01	HVSGR B	1.11E-05	3.37E-07	9.07E-04	3.03E-05	3.71E-05	1.14E-06	8.70E-04	2.92E-05	-8.96E-04	-3.00E-05	-2.60E-05	-8.03E-07	8.70E-04	2.92E-05
R-01	CD SWGR	1.18E-07	4.20E-09	1.41E-05	4.42E-07	0.00E+00	0.00E+00	1.41E-05	4.42E-07	-1.40E-05	-4.38E-07	1.18E-07	4.20E-09	1.18E-07	4.20E-09
S-01	HVSGR A	5.14E-06	1.60E-07	4.58E-04	1.51E-05	5.64E-05	1.81E-06	4.02E-04	1.33E-05	-4.53E-04	-1.49E-05	-5.13E-05	-1.65E-06	4.02E-04	1.33E-05
T-01	CCW HX and Pump Rm	1.11E-07	8.62E-10	7.58E-07	1.28E-09	0.00E+00	0.00E+00	7.58E-07	1.28E-09	-6.47E-07	-4.18E-10	1.11E-07	8.62E-10	1.11E-07	8.62E-10

Table W-3 Davis-Besse Fire Compartment Risk Summary[1]

		Transitioning Plant		Current As-Built Plant		All VFDRs Fixed		Excluding Risk Offset				Net Delta			
		R1[4]		R3[4]		R4[2]		FRE Delta Risk (R3-R4)		Risk Offset (R1-R3)		Net Delta (R1-R4)		Additional Risk of RAs[3]	
Fire Compartment	Description	CDF (R1)	LERF (R1)	CDF (R3)	LERF (R3)	CDF (R4)	LERF (R4)	Delta ALL CDF (R3-R4)	Delta ALL LERF (R3-R4)	Roff CDF	Roff LERF	Net CDF	Net LERF	CDF	LERF
U-01	SFP PUMP	3.00E-07	1.00E-08	3.12E-06	4.32E-08	0.00E+00	0.00E+00	3.12E-06	4.32E-08	-2.82E-06	-3.32E-08	3.00E-07	1.00E-08	3.00E-07	1.00E-08
UU-01	Aux Build Elevator/Stairwell	0.00E+00	0.00E+00	1.64E-10	4.91E-12	0.00E+00	0.00E+00	1.64E-10	4.91E-12	-1.64E-10	-4.91E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
V-01	FUEL HAND	3.32E-07	8.80E-09	8.48E-06	1.11E-07	0.00E+00	0.00E+00	8.48E-06	1.11E-07	-8.15E-06	-1.02E-07	3.32E-07	8.80E-09	3.32E-07	8.80E-09
VA-01	Aux Bldg Stairwell 3A	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
X-01	LVSGR F	3.13E-06	8.52E-08	1.53E-04	4.95E-06	7.98E-06	3.09E-07	1.45E-04	4.64E-06	-1.50E-04	-4.86E-06	-4.85E-06	-2.24E-07	1.45E-04	4.64E-06
X-02	Battery Room B	2.87E-08	8.98E-10	2.57E-06	7.79E-08	0.00E+00	0.00E+00	2.57E-06	7.79E-08	-2.54E-06	-7.70E-08	2.87E-08	8.98E-10	2.87E-08	8.98E-10
Y-01	LVSGR E	5.84E-07	2.01E-08	3.80E-06	1.40E-07	1.33E-06	4.60E-08	2.47E-06	9.40E-08	-3.22E-06	-1.20E-07	-7.46E-07	-2.59E-08	2.47E-06	9.40E-08
Y-02	Battery Room A	3.43E-10	0.00E+00	4.34E-09	6.43E-11	0.00E+00	0.00E+00	4.34E-09	6.43E-11	-4.00E-09	-6.43E-11	3.43E-10	0.00E+00	3.43E-10	0.00E+00
Total		**3.98E-05**	**1.17E-06**	**2.38E-03**	**7.58E-05**			**2.05E-03**	**6.56E-05**	**-2.34E-03**	**-7.46E-05**	**-2.90E-04**	**-9.03E-06**	**1.89E-03**	**6.11E-05**

1) Every compartment addresses NFPA 805 Basis 4.2.4.2, and contains at least two VFDRs one requires a Recovery Action.

2) When R4 = 0.00E+00, the Transitioning plant CDF < 5E-07, and LERF <5E-08, then the compliant case is conservatively assumed to reduce risk to 0.00E+00.

3) There are many operator actions that are modeled in the PRA. In order to verify all operator actions are captured, the Additional Risk of RAs is equal to the All VFDR resolved case, and the delta is reported without credit for the risk offset; therefore, the threshold is exceeded. However, this value is not used for compliance with RG 1.174 or RG 1.205.

4) If R1 or R3 = 0.00E+00, it is not indicative of no risk. 0.00E+00 represents the risk is below the truncation limit of CDF < 1E-10 and LERF <1E-12.