Exelon Generation

# R. E. Ginna Nuclear Power Plant

# Fire Protection Program

## Revision 17

## Volumes I -III

# TABLE OF ACRONYMS

| Acronym | Definition |
|---|---|
| AB | Auxiliary Building |
| AFFF | Aqueous Film Forming Foam |
| AFW | Auxiliary Feedwater |
| AHJ | Authority Having Jurisdiction |
| ALARA | As Low As Reasonably Achievable |
| ANSI | American National Standards Institute |
| APCSB | Auxiliary and Power Conversion Systems Branch |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society of Testing and Materials |
| BIT | Boron Injection Tank |
| BOP | Balance of Plant |
| BTP | Branch Technical Position |
| BTU | British Thermal Unit |
| BWR | Boiling Water Reactor |
| CC | Control Building Complex |
| CCP | Centrifugal Charging Pump |
| CCS | Component Cooling System |
| CCTV | Closed Circuit Television |
| CCW | Component Cooling Water |
| CCZ | Combustible Control Zone |
| CENG | Constellation Energy Generation Group |
| CDF | Core Damage Frequency |
| CDWE | Condensate Demineralizer Waste Evaporator |

| **Acronym** | **Definition** |
|---|---|
| CFR | Code of Federal Regulation |
| CGG | Constellation Energy Generation Group |
| CI | Containment Isolation |
| CIV | Containment Isolation Valve |
| CPB | Canister Preparation Building |
| CREATS | Control Room Emergency Air Treatment System |
| CRDM | Control Rod Drive Mechanism |
| CRT | Cathode Ray Tube |
| CSA | Canadian Standards Association |
| CST | Condensate Storage Tank |
| CSST | Common Station Service Transformers |
| CT | Current Transformer |
| CVCS | Chemical and Volume Control System |
| DBA | Design Basis Accident |
| DBE | Design Basis Event |
| DCR | Drawing Change Request |
| DID | Defense-In-Depth |
| DG | Diesel Generator |
| DGB | Diesel Generator Building |
| EAC | Diesel Generator Emergency Power System |
| ECCS | Emergency Core Cooling System |
| EDG | Emergency Diesel Generator |
| EEE | Engineering Equivalency Evaluation |
| EEEE | Existing Engineering Equivalency Evaluation |
| EPRI | Electric Power Research Institute |

| Acronym | Definition |
|---|---|
| EGTS | Emergency Gas Treatment System |
| EPS | Emergency Power System |
| ERCW | Essential Raw Cooling Water |
| ERFBS | Electrical Raceway Fire Barrier System |
| ETL | Electro-Thermo Link |
| FAA | Fire Area Assessment |
| FAQs | Frequently Asked Questions |
| FD | Fire Department |
| FHA | Fire Hazards Analysis |
| FIF | Fire Initiating Frequencies |
| FM | Factory Mutual |
| FP | Fire Protection |
| FPP | Fire Protection Program |
| FPPR | Fire Protection Program Report |
| FR | Federal Register |
| FRE | Fire Risk Evaluation |
| FRP | Fire Response Plan |
| FSAR | Final Safety Analysis Report |
| GAB | Ginna Administrative Building |
| GDC | General Design Criteria |
| HEPA | High Efficiency Particulate Absorption |
| HPFP | High Pressure Fire Protection |
| HPSW | High Pressure Spray Wash |
| HRA | High Risk Activity |
| HRE | High Risk Evolution |

| Acronym | Definition |
|---|---|
| HSD | Hot Shutdown |
| HSS | High Safety Significant |
| HVAC | Heating, Ventilation and Air Conditioning |
| IB | Intermediate Building |
| IEEE | Institute of Electrical and Electronics Engineers |
| IPEEE | Individual Plant Examination External Events |
| ISL | Instrument Sensing Line |
| ISM | Industrial Safety Manual |
| KSF | Key Safety Function |
| LAR | License Amendment Request |
| LCC | Lower Compartment Cooling |
| LERF | Large Early Release Frequency |
| LOCA | Loss of Coolant Accident |
| LOSP | Loss of Site Power |
| LSS | Low Safety Significant |
| MAC | 4160V AC Electrical System |
| MCC | Motor Control Center |
| MCR | Main Control Room |
| MDAFW | Motor Driven Auxiliary Feedwater |
| MOV | Motor Operated Valve |
| MSIV | Main Steam Isolation Valve |
| MSO | Multiple Spurious Operation |
| ND | Nuclear Directive |
| NEI | Nuclear Energy Institute |
| NELPIA | Nuclear Energy Liability and Property Insurance Agency |

| Acronym | Definition |
|---|---|
| NER | Nuclear Experience Review |
| NFPA | National Fire Protection Association |
| NFPA | National Fire Protection Association |
| NIOSH | National Institute for Occupational Safety and Health |
| NPSH | Net Positive Suction Head |
| NPO | Non-Power Operational |
| NRC | Nuclear Regulatory Commission |
| NSCA | Nuclear Safety Capability Assessment |
| NSPC | Nuclear Safety Performance Criteria |
| NSRB | Nuclear Safety Review Board |
| NUREG | US Nuclear Regulatory Commission Regulation |
| OE | Operating Experience |
| OMA | Operator Manual Action |
| OR | Operating Requirement |
| OS&Y | Outside Screw and Yoke |
| OSHA | Occupational Safety and Health Administration |
| P&ID | Piping and Instrumentation Diagrams (Plant Flow Diagrams) |
| PIV | Post Indicator Valve |
| PORC | Plant Operations Review Committee |
| PORV | Power-Operated Relief Valve |
| PRA | Probabilistic Risk Assessment |
| PRT | Pressurizer Relief Tank |
| PWR | Pressurized Water Reactor |

| Acronym | Definition |
|---|---|
| QA | Quality Assurance |
| RADCON | Radiological Control |
| RAW | Risk Achievement Worth |
| RC | Reactor Containment Building |
| RCP | Reactor Coolant Pump |
| RCS | Reactor Coolant System |
| RCW | Raw Cooling Water |
| REG | R.E. Ginna Nuclear Power Plant |
| RG | Regulatory Guide |
| RHR | Residual Heat Removal |
| RI-PB | Risk-Informed Performance-Based |
| RIS | Regulatory Issues Summary |
| RPS | Reactor Protection System |
| RSW | Raw Service Water |
| RWST | Refueling Water Storage Tank |
| SAFW | Standby Auxiliary Feedwater |
| SE | Safety Evaluation |
| SB | Service Building |
| SER | Safety Evaluation Report |
| SFP | Spent Fuel Pool |
| SFPE | Society of Fire Protection Engineers |
| SG | Steam Generator |
| SH | Screen House Building |

| **Acronym** | **Definition** |
|---|---|
| SI | Safety Injection |
| SSA | Safe Shutdown Analysis |
| SSC | Structure, System, or Component |
| SSD | Safe Shutdown |
| SSEL | Safe Shutdown Equipment List |
| SW | Service Water |
| TB | Turbine Building |
| TDAFWP | Turbine Driven Auxiliary Feedwater Pump |
| TIR | Testing and Inspection Requirements |
| TR | Technical Report |
| TSC | Technical Support Center |
| TO | Turbine Oil Storage Building |
| UFSAR | Updated Final Safety Analysis Report |
| UL | Underwriters' Laboratory |
| UFSAR | Updated Final Safety Analysis Report |
| USNRC | United States Nuclear Regulatory Commission |
| VCT | Volume Control Tank |
| VFDR | Variance From Deterministic Requirements |
| ZOI | Zone of Influence |
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# PART I INTRODUCTION

## 1.0 Purpose

The purpose of the Fire Protection Program Report (FPPR) is to consolidate a sufficiently detailed summary of the Ginna Station regulatory required Fire Protection Program into a single document.

The FPPR documents Ginna Station's Fire Protection Plan, Fire Hazards Analysis, and historical Appendix R Safe Shutdown evaluation, along with the NFPA 805 evaluation which ensures that Ginna safe and stable conditions can be maintained.

The fire protection program is a risk-informed performance based (RI-PB) fire protection licensing basis which complies with the requirements in 10 CFR 50.48 (a) and 10 CFR 50.48 (c); the guidance in Regulatory Guide (RG) 1.205, "Risk-Informed Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," Revision 1, and National Fire Protection Association (NFPA) 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition.

## 2.0 Background

On May 11 and September 28, 1976, the NRC requested a comparison between Ginna's fire protection program and Branch Technical Position (BTP) APCSB 9.5-1 for Ginna Station. On February 24, 1977, Ginna responded to this request with the Fire Protection Evaluation for Ginna Station. The report consisted of a comparison of the existing fire protection program provisions with the guidelines of Appendix A to BTP APCSB 9.5-1, a fire hazards analysis of all identified fire areas, and a safe shutdown analysis to evaluate the capability of Ginna to be safely shutdown in the event of a fire. On November 19, 1980, the NRC published 10CFR50.48, "Fire Protection", and a new Appendix R to l0CFR50 which established fire protection requirements for operating nuclear power plants. This rule became effective on February 17, 1981 and it specified certain fire protection features for operating nuclear power plants licensed before January 1979.

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 Risk-Informed, Performance Based (RI-PB) fire protection requirements. 10 CFR 50.48 (c) incorporates by reference, with exceptions, 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.

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

Regulatory Guide (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.

Constellation Energy submitted to the NRC a letter of intent to transition the Ginna fire protection program to adopt NFPA 805 in accordance with 10 CFR 50.48(c) on December 19, 2005. This letter also requested an enforcement discretion period of three years. By letter dated July 31, 2006, the NRC granted a three year enforcement discretion period.

In a letter dated September 26, 2008, Constellation Energy requested that the period of enforcement discretion be extended until six months after the approval of the second pilot transition request. By letter dated November 20, 2008, the NRC approved the enforcement discretion extension request.

In a letter dated June 20, 2011, Constellation Energy committed to submit a license amendment request for Ginna to transition to 10 CFR 50.48(c) by March 29, 2013. By letter dated July 28, 2011, the NRC acknowledged the application date for Ginna and extended enforcement discretion in accordance with SRM-SECY-11-0061. The Safety Evaluation was issued to Ginna on November 23, 2015 (ML15271A101).

Subsequently, on June 30, 2017, a license amendment request associated with the implementation of NFPA 805, 2001 edition, was submitted to the NRC. The Safety Evaluation for this change was issued to Ginna on June 25, 2018 (ML18114A025) with identified correction dated July 12, 2018 (ML18190A472).

The Fire Protection Program Report (FPPR) was initially developed in 1998 in an effort to consolidate various fire protection related documentation including the Fire Protection Plan, Fire Hazards Analysis, Safe Shutdown Analysis, Appendix A Commitments, Appendix R Commitments, Operating Experience documentation related to fire protection, NFPA code compliance information, and fire protection engineering evaluations.

# 3.0 Scope

This report includes the following documentation:

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| Fire Protection Plan (Part II) | Part II describes the controls associated with the Ginna Station Fire Protection Program; identifies the organizations and positions that are responsible for the fire protection program; describes the authority of positions responsible for implementing the program; and outlines the plans for fire protection, fire detection and suppression capability, and limitation of fire damage. The fire protection plan describes the features necessary to implement the fire protection program such as: administrative controls; personnel requirements for fire prevention and manual fire suppression activities; automatic and manually operated fire detection and suppression systems; and the means to limit fire damage to structures, systems, and components important to safety so that the capability to safely shutdown the plant is ensured. |
| Fire Hazards Analysis (Part III) | Part III describes the fire hazards analysis that has been performed for Ginna Station. This part includes evaluations of the fire areas/fire zones at Ginna Station and includes identification of major safe shutdown and non-safe shutdown related equipment, suppression and detection systems, and the physical characteristics of the required fire barriers (including barrier ratings and construction materials, fire doors and fire dampers). The combustible loading and fire severity in the fire area/fire zone are also identified. Potential hazards in each fire area/fire zone are presented as are summaries of engineering evaluations and identification of NRC approvals from NFPA 805 Chapter 3 requirements applicable to each fire area/fire zone. |
| Safe and Stable Analysis (Part IV) | Part IV describes the fire protection features that ensure safe and stable shutdown capability at Ginna and the relationship of these features to the requirements of NFPA 805. The rescinded exemptions from the requirements of Appendix R along with the summary of the bases is also included in this section, along with the NRC approvals from the specific requirements of NFPA 805 Chapter 3 with the basis for granting the requests. |
| Appendix A (Historical) | Summary of Appendix A Commitments – Appendix A represents a line by line comparison of Ginna Station's conformance to BTP APCSB 9.5-1, Appendix A. The status of conformance with the guidelines is summarized. |
| Appendix B | B-1 Table. Represents the compliance and compliance basis to the NFPA 805 Chapter 3 requirements. |

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| Appendix C | NFPA Code Compliance Summary – Appendix C contains a review of compliance with selected NFPA codes. |
| Appendix D | Non Power Ops Table. This table represents the Non-Power Operations Component Pinch Point Analysis performed using the methodoloby contained in NEI 04-02 and FAQ 07-0040. |
| Appendix E | Summary of Fire Protection Engineering Evaluations – Appendix E contains a summary of engineering evaluations that have been prepared to document and justify general fire protection evaluations/configurations within the plant. |
| Appendix F | Radioactive Release Transition Table. This table represents the Radioactive Release Review which documents that the fire protection program is compliant with the requirements of NFPA 805 Chapter 4, section 4.3, and the guidance in NEI 04-02 along with RG 1.205. |
| Appendix G | Plant Modifications committed to for compliance with NFPA 805 |
| Appendix H | B-3 Table, Represents the Results of the review of the Fire Area Transition for NFPA 805. |
| Appendix I | Recovery Actions required for compliance with NFPA 805. |

# PART II FIRE PROTECTION PLAN

## 1.0 Purpose

The purpose of this report section is to describe the Fire Protection Plan developed for Ginna Station to ensure compliance with the requirements of 10CFR50.48 (c).

## 2.0 Objective of the Fire Protection Program

The Fire Protection Plan describes the controls associated with the Ginna Station Fire Protection Program; identifies the organizations and positions that are responsible for the fire protection program; describes the authority of positions responsible for implementing the program; and outlines the plans for fire protection, fire detection and suppression capability, and limitation of fire damage. The fire protection plan describes the features necessary to implement the fire protection program such as: administrative controls; personnel requirements for fire prevention and manual fire suppression activities; automatic and manually operated fire detection and suppression systems; and the means to limit fire damage to structures, systems, and components important to safety so that the capability to safely shutdown the plant is ensured.

## 3.0 Basis of the Fire Protection Plan

The Fire Protection Plan at Ginna Station was historically developed to comply with and was based upon the requirements of General Design Criteria 3 in Appendix A to 10CFR50, 10CFR50.48, paragraph (a), and Ginna's commitment to implement Sections III.G, III.J, and III.O to 10CFR50, Appendix R and Appendix A to Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976" (August 23, 1976). Historically, the requirements contained in Section III.L of Appendix R to 10CFR50 were also applicable to areas where alternate shutdown capability is selected.

In February 1981, the fire protection rule (10 CFR 50.48 and Appendix R to 10 CFR50) became effective, which promulgated criteria related to the safe shutdown capability following a potential fire and other fire protection features.

On July 16, 2004, the Nuclear Regulatory Commission amended 10CFR50.48, "Fire Protection" to add a new subsection, 10CFR50.48(c), which established acceptable fire protection program requirements. The change to 10CFR50.48 endorsed, with exceptions, the National Fire Protection Association's Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants" – 2001 Edition, as a voluntary alternative for demonstrating compliance with 10CFR50.48 subsections (a) and (b). On December 19, 2005 Constellation Energy Nuclear Generation, LLC (CENG) submitted a Letter of Intent (LOI) to the NRC to adopt NFPA 805-2001 for R.E. Ginna Nuclear Power Plant (REG).

The Safety Evaluation for the NFPA 805 License Amendment Request was issued to Ginna on November 23, 2015 (ML15271A101).

Subsequently, on June 30, 2017, a license amendment request associated with the implementation of NFPA 805, 2001 edition, was submitted to the NRC. The Safety Evaluation for this change was issued to Ginna on June 25, 2018 (ML18114A025) with identified correction dated July 12, 2018 (ML18190A472).

# 4.0 References

## 4.1 Regulatory Documents

**4.1.1** Branch Technical Position (Auxiliary Power and Control Systems Branch) 9.5-1, Appendix A

**4.1.2** 10CFR50.48 - Fire Protection

**4.1.3** 10CFR50, Appendix A, Criterion 3 - "Fire Protection"

**4.1.4** 10CFR50 Appendix R - Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979

**4.1.5** NRC letter dated August 19, 1977 - Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance

**4.1.6** Generic Letter 81-12 - Fire Protection Rule and NRC Memorandum of Clarification for Generic Letter 81-12, dated March 22, 1982

**4.1.7** Generic Letter 82-21 - Technical Specifications for Fire Protection Audits

**4.1.8** Generic Letter 83-33 - NRC Positions on Certain Requirements of Appendix R to 10CFR50.

**4.1.9** Generic Letter 86-10 - Implementation of Fire Protection Requirements

**4.1.10** Generic Letter 86-10 - Supplement 1 - Fire Endurance Acceptance Criteria for Fire Barrier Systems Used to Separate Redundant Safe Shutdown Trains within the Same Fire Area

**4.1.11** Generic Letter 88-12 - Removal of Fire Protection Requirements from Technical Specifications

**4.1.12** NUREG-0452, Standard Technical Specifications for Westinghouse Pressurized Water Reactors, Revision 4 (referred to as standard Technical Specifications)

**4.1.13** NRC Inspection and Enforcement Bulletin No. 75-04, March 24, 1975 and No. 75-04A, April 3, 1975.

**4.1.14** Regulatory Guide 1.205, Revision 1, “Risk-Informed, Performance-Based Fire Protection for Light-Water Nuclear Power Plants.”

**4.1.15** 10 CFR 50.48 (c), “National Fire Prevention Association Standard NFPA 805 (2001 edition).”

# 4.2 Documents

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|---|---|
| **4.2.1** | A-601.13, Fire Protection/Appendix R Compensatory Actions |
| **4.2.2** | Updated Final Safety Analysis Report (UFSAR) |
| **4.2.3** | Fire Protection Safety Evaluation Report for R. E. Ginna Nuclear Power Plant, February 14, 1979 |
| **4.2.4** | SER Supplement, dated December 17, 1980. |
| **4.2.5** | SER Supplement, dated February 6, 1981. |
| **4.2.6** | SER Supplement, dated June 22, 1981. |
| **4.2.7** | Appendix R SER, dated February 27, 1985. |
| **4.2.8** | SER Supplement, dated March 21, 1985. |
| **4.2.9** | Letter dated May 25, 1979 from L.D. White (Ginna) to D.Ziemann (NRC) NRR, subject: Fire Protection at R.E. Ginna Nuclear Power Plant |
| **4.2.10** | Technical Requirements Manual (TRM) |
| **4.2.11** | Fire Protection System RGE-59 Training System Description |
| **4.2.12** | Fire Protection Related Plant Procedures |
| **4.2.12.1** | A-52.4, Control of Limiting Conditions for Operating Equipment |
| **4.2.12.2** | A-52.12, Inoperability of Equipment Important to Safety |
| **4.2.12.3** | A-54.7, FP Tour |
| **4.2.12.4** | A-102.12, Fire Watch Training |
| **4.2.12.5** | A-103.9, Fire Brigade Training |
| **4.2.12.6** | CC-AA-20, Configuration Management |
| **4.2.12.7** | CC-AA-102, Design Input and Configuration Change Impact Screening |
| **4.2.12.8** | CC-AA-209, Fire Protection Program Configuration Change Review |
| **4.2.12.9** | CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Change Review |
| **4.2.12.10** | CC-AA-211, Fire Protection Program |
| **4.2.12. 11** | Deleted |
| **4.2.12.12** | EP-3-P-0132, Fixed Combustible Loading |
| **4.2.12.13** | ER-FIRE.1, Alternate Shutdown for Control Complex Fire |
| **4.2.12.14** | ER-FIRE.2, Alternate Shutdown for Cable Tunnel Fire |
| **4.2.12.15** | ER-FIRE.3, Alternate Shutdown for Auxiliary Building Basement/ Mezzanine Fire |
| **4.2.12.16** | ER-FIRE.4, Alternate Shutdown for Battery Room A Fire |
| **4.2.12.17** | ER-FIRE.5, Alternate Shutdown for Battery Room B Fire |
| **4.2.12.18** | ER-FIRE.6, Response to Fire in D/G B Vault |
| **4.2.12.19** | FPS-1, Fire Barrier Procedure Control |

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| **4.2.12.20** | FPS-2, Ginna Station Fire Barrier Penetration Seal Program |
| **4.2.12.21** | FPS-3, Fire Barrier Inspection Program |
| **4.2.12.22** | Deleted. |
| **4.2.12.23** | FPS-2.3, Temporary Fire Barrier Penetration Seal Program |
| **4.2.12.24** | OP-CE-201-007, Fire Protection System Impairment Control |
| **4.2.12.25** | FPS-5, Inspection Lubrication and/or Spring Testing of PIV &Curb Valves |
| **4.2.12.26** | FPS-6, Wall Hydrants and Yard Hydrants |
| **4.2.12.27** | FPS-7, Velocity Flush of Fire Water System |
| **4.2.12.28** | FPS-12, Trailer Admittance Requirements |
| **4.2.12.29** | FPS-13, Out Building Alarm Testing Procedures (13.1 through 13.7) |
| **4.2.12.30** | FPS-14, Fire Hose Reel Inspection and Testing |
| **4.2.12.31** | FPS-15, Fire Door Identification, Inspection and Maintenance |
| **4.2.12.32** | FPS-17, Life Safety Emergency Light Surveillance |
| **4.2.12.33** | GC-76.2, Concrete and Block Wall Restoration |
| **4.2.12.34** | IP-OUT-2, Ginna Site Specific Outage Risk Management |
| **4.2.12.35** | LS-AA-128-101, Regulatory Review of Proposed Changes to the Approved NFPA 805 Fire Protection Program |
| **4.2.12.36** | M-56 Series, Maintenance and Installation of Fire Seals; Boot Seals; Cable Coating; and Appendix R Fire Wrap (includes M-56.1, 3, 6, 8 and 9). |
| **4.2.12.37** | M-103, Inspection and Maintenance of Fire Dampers |
| **4.2.12.38** | MA-AA-716-026, Station Housekeeping/Material Condition Program |
| **4.2.12.39** | NO-AA-1, Quality Self Assessment |
| **4.2.12.40** | NO-AA-10, Quality Assurance Topical Report (QATR) |
| **4.2.12.41** | OP-AA-201-001, Fire Marshal Tours |
| **4.2.12.42** | OP-AA-201-003, Fire Drill Performance |
| **4.2.12.43** | OP-AA-201-004, Fire Prevention for Hot Work |
| **4.2.12.44** | OP-AA-201-005, Fire Brigade Qualification |
| **4.2.12.45** | OP-AA-201-006, Control of Temporary Heat Sources |
| **4.2.12.46** | OP-AA-201-008, Pre-Fire Plan Manual |
| **4.2.12.47** | OP-AA-201-009, Control of Transients |
| **4.2.12.48** | Deleted |

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| **4.2.12.49** | SA-AA-122, Handling and Storage of Compressed Gas Cylinders/Portable Tanks and Cryogenic Containers/Dewars |
| **4.2.12.50** | STP-0-13 Series, Standard Test Procedures for Fire Protection System Components |
| **4.2.12.51** | SC-3, Fire Emergency Plan |
| **4.2.12.52** | SC-3.1, Fire Emergency General Information |
| **4.2.12.53** | SC-3.1.1, Fire Alarm Response |
| **4.2.12.54** | SC-3.2.1 through SC-3.2.11, This series covers immediate actions for plant areas |
| **4.2.12.55** | SC-3.3.1, Immediate Fire Notification |
| **4.2.12.56** | SC-3.3.2, Offsite Notification of Fire |
| **4.2.12.57** | SC-3.4.0 through SC-3.4.4, this series covers fire assessment; brigade captain and control room personnel responsibilities; reactor safety assessments and; escalation of fire response actions. |
| **4.2.12.58** | Deleted |
| **4.2.12.59** | SC-3.5.1, Evaluation of Radiation and Contamination Exposure of a Fire- Fighting Personnel |
| **4.2.12.60** | SC-3.7, Evacuation of a Fire Involved Area |
| **4.2.12.61** | SC-3.8, Personnel Accountability during a Fire |
| **4.2.12.62** | SC-3.10, Fire Damage Control |
| **4.2.12.63** | SC-3.11.1, Immediate Re-Entry to a Fire Area |
| **4.2.12.64** | SC-3.8, Emergency Evacuation, Accountability and Search & Rescue of Protected Ara Structures |
| **4.2.12.65** | SC-3.12, Plan for Recovery from Fire |
| **4.2.12.66** | SC-3.13, Fire Communication |
| **4.2.12.67** | SC-3.15.3, Portable Extinguisher Inspection |
| **4.2.12.68** | SC-3.15.15, Emergency Fire Locker Inventory and Inspection |
| **4.2.12.69** | SC-3.16.1 through SC-3.16.15.1 covers operating instructions for fire protection equipment |
| **4.2.12.70** | SC-3.19, Snow Removal for Access to Fire Equipment |
| **4.2.13** | Fire Protection Related Drawings |
| **4.2.13.1** | 10905-80, Fire Pump |
| **4.2.13.2** | 10905-161, Fire Service Booster Pump |
| **4.2.13.3** | 10905-324 through 327, Fire Control Panel |
| **4.2.13.4** | 21488-100, Fire Smoke and Pressure Barriers (Sheets 1-6) |

**4.2.13.5** 21488-102 through 21488-122 (inclusive of all sheets), Fire Barrier Penetration Seal Detail Drawings

**4.2.13.6** 21488-201 through 21488-204 (inclusive of all sheets), Ginna HEMYC Wrap Drawings

**4.2.13.7** 33013-1862, Locations for Fire Damper Detailed in the Fire Damper Manual

**4.2.13.8** 33013-2617, Fire Door Locations (Sheets 1-3)

**4.2.13.9** 33013-2680 - FHA Fire Area/Fire Zone Boundary Drawing Fixed Combustible Loading Table (void - for reference only)

**4.2.13.10** 33013-2540 through 33013-2581, Fire Response Plan Drawings

**4.2.14** ME-302, Fire Barrier Penetration Seals Program

**4.2.15** Fire Response Plan procedures FRP-1.0 through FRP-52.0

**4.2.16** Fire Response Plan drawings 33013-2540 through -2588 and -2916, 1, 2

**4.2.17** 51-9064339-003, NFPA 805 Fundamental Fire Protection Program and Design Elements Transition Review. This reference is "historic". It was classified "historic" to capture the B-1 Table as presented to the NRC to support the approved NFPA 805 License Amendment Request (WPLNRC-1003035). The B-1 Table now resides in Appendix B. Changes to the B-1 Table are made using IP-FPP-1.

**4.2.18** 51-9191818-000, R.E. Ginna Nuclear Power Plant Appendix B-2 Transition of Nuclear Safety Performance. This reference is "historic". It was used to evaluate the NSCA methodology against NEI 00-01 Rev. 2. It was used to support the submittal of the approved NFPA 805 License Amendment Request (WPLNRC-1003035).

**4.2.19** 51-9089546-001, R.E. Ginna NFPA 805 Nuclear Safety Capability Assessment. This reference is "historic". It was superseded by 0028-0011-007-001.

**4.2.20** 51-9140371-000, R.E. Ginna Nuclear Power Station – NFPA 805 Transition – Non-Power Operations Component Selection. This reference is "historic". It was used as design input to the historical Non-Power Operations Pinch Point Analysis 51-9177694-000. Similarly, to the NSCA, this reference represents the plant as it was a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

**4.2.21** 51-9177694-000, R.E. Ginna Nuclear Power Station – NFPA 805 Transition – Non-Power Operations Component Pinch Point Analysis. This reference is "historic". It is classified "historic" since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

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

**4.2.23** FAQ 07-0040 Rev. 4, Non-Power Operations Clarification, ML082070249 and ML082200528.

**4.2.24** NEI 04-02, Revision 2, "Guidance for Implementing a Risk Informed, Performance-Based Fire Protection Program under 10 CFR50.48 (c)."

**4.2.25** FAQ 07-0054 Revision 1, Demonstrating Compliance with Chapter 4 of NFPA 805, ML103510379 and ML110140183.

**4.2.26** 51-9065290-000, NFPA 805 Radiological Release Transition Review. This reference is "historic". It was classified "historic" since it was used to document the NEI 04-02 Radioactive Release Transition Review, and the creation of the Radioactive Release Transition Table. This Table now resides in Appendix F of EPM-FPPR.

**4.2.27** 51-9183281-00A, R.E. Ginna NFPA 805 Fire Suppression Effects Analysis.

**4.2.28** HAI-0028-0011-002-003, R.E. Ginna Nuclear Power Station NFPA 805 Fire Risk Assessments. This reference is "historic". It was developed as part of the NFPA 805 project and was used as an input to determine what recovery actions and modifications were required to achieve and safe and stable hot shutdown condition. It is classified "historic" since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

**4.2.29** 0028-0011-008-001, R.E. Ginna Non-Power Operations Upgrade. This reference is “historic”. It is classified “historic” since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

**4.2.30** 0028-0011-007-001, Ginna NFPA 805 Nuclear Safety Capability Assessment. This reference is “historic”. It was developed as an input to the NFPA 805 transition to ultimately determine what recovery actions and modifications were required to achieve and safe and stable hot shutdown condition. It is classified “historic” since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

## 4.3 Other Documents

**4.3.1** ASTM E814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops

**4.3.2** National Fire Protection Handbook, 17th Edition

**4.3.3** ASTM E84, Test for Surface Burning Characteristics of Building Materials

**4.3.4** NFPA Codes and Standards

**4.3.4.1** NFPA 12A - Halon 1301 Fire Extinguishing Systems

**4.3.4.2** NFPA 13 - Installation of Sprinkler Systems

**4.3.4.3** NFPA 14 - Standpipe and Hose Systems

**4.3.4.4** NFPA 15 - Water Spray Fixed Systems for Fire Protection

**4.3.4.5** NFPA 20 - Centrifugal Fire pumps

**4.3.4.6** NFPA 24 - Outside Protection

**4.3.4.7** NFPA 26 - Supervision of Valves Controlling Water Supplies for Fire Protection

**4.3.4.8** NFPA 27 - Private Fire Brigade

**4.3.4.9** 51-9159545, RE Ginna Nuclear Station Code Compliance Evaluation for NFPA 30, Flammable and Combustible Liquids Code, 2000 edition

**4.3.4.10** NFPA 37 - Stationary Combustible Engines and Gas Turbines

**4.3.4.11** NFPA 72D - Proprietary Protective Signaling Systems

**4.3.4.12** NFPA 72E - Automatic Fire Detectors

**4.3.4.13** Gilbert Commonwealth Fire Hazards Analysis, 1977

**4.3.4.14** Impell Updated Fire Hazards Analysis, 1986

**4.3.4.15** DA-ME-98-083, BOP Fire Area Evaluation

**4.3.4.16** NFPA 232, Standard for the Protection of Records

**4.3.4.17** NFPA 805, 2001 Edition, Fire Protection for Light Water Reactor Electric Generating Plants

**4.3.4.18** 51-9159544, RE Ginna Nuclear Station Code Compliance Evaluation for NFPA 600, Standard on Industrial Fire Brigades, 2000 Edition.

**NOTE:** Appendix C of the Fire Protection Program Report documents the level of compliance with the NFPA codes and standards identified in Section 4.3.4.

## 5.0 Definitions

Approved - Tested and accepted for a specific purpose or application by a nationally recognized testing laboratory or acceptable to the authority having jurisdiction.

Aqueous Film Forming Foam (AFFF) - Synthetic foam concentrates based on fluorinated sur- factants plus foam stabilizers usually diluted with water to a 3% or 6% solution. The foam formed acts both as a barrier to exclude air or oxygen and to develop an aqueous film on the fuel surface capable of suppressing the evolution of fuel vapors. The foam produced with AFFF concentrate is dry chemical compatible and this is suitable for combined use with dry chemicals.

Authority Having Jurisdiction (AHJ) - The organization, office, or individual responsible for "approving" equipment, an installation, or a procedure.

Automatic - Self-acting, operated by its own mechanism when actuated by some impersonal influence such as a change in current, pressure, temperature or mechanical configuration.

Barrier - A feature of construction provided to separate or enclose various occupancies to create a boundary limit based on functional requirements, or a flexible material designed to withstand the penetration of water, vapor, grease, or harmful gases.

Combustible Material - Material which does not meet the definition of noncombustible. Any material which in the form in which it is used and under the conditions anticipated will ignite and burn (e.g., cable insulation, lube oil, plastic sheeting, charcoal, paper, etc.)

Combustible Liquid - A liquid having a flash point at or above $100^0$F($37.8^0$C).

Compensatory Actions - Actions taken if impairment to a required system, feature, or component prevents that system, feature, or component from performing its intended function. These actions are a temporary alternative means of providing reasonable assurance that the necessary function will be compensated for during the impairment, or an act to mitigate the consequence of a fire. Compensatory measures include but are not limited to actions such as fire watches, administrative controls, temporary systems, and features of components.

Deterministic Approach - A deterministic approach establishes requirements for engineering margin and quality assurance in design, manufacture, and construction. It involves implied, but unquantified, elements of probability in the selection of the specific accidents to be analyzed as design basis events. It does not integrate results in a comprehensive manner to assess the overall impact of postulated initiating events.

Engineering - The organization responsible for the design basis of the plant.

Essential Personnel – Personnel who are required to perform functions to mitigate the effects of a fire including but not limited to industrial fire brigade members, operations, health physics, security, and maintenance.

Fire Area - A fire area is defined as that portion of a building or plant that is separated from other areas by boundary fire barriers (walls, floors and ceilings with any openings or penetrations protected with seals or closures having a fire resistance rating equal to that required of the barrier). Open stairwells and hatchways in ceilings and floors are not fire area boundaries.

Fire Barrier - A fire barrier is a continuous vertical or horizontal membrane, such as a wall or floor/ceiling assembly, that is designed and constructed with a specified fire resistance rating. Fire barriers limit the spread of fire and restrict the movement of smoke. Such barriers may have protected openings.

Fire Break (Fire Stop) - A passive fire protection feature of construction intended to limit flame propagation along vertical or horizontal cable tray runs. Note: Functionally identical to "Fire Stop".

Fire Damper - A device, installed in the air distribution system, designed to close automatically upon detection of heat or release as the result of a signal from a sensing device such as a Halon discharge signal or a smoke detector, to interrupt migratory air flow, and to restrict the passage of flame. A combination fire and smoke damper shall meet the requirements of both.

Fire Detector - A device designed to automatically detect the presence of fire and initiate an alarm system and other appropriate action (see NFPA 72E, "Automatic Fire Detectors").

Fire Door – A door assembly rated in accordance with NFPA 252, and installed in accordance with NFPA 80.

Fire Door Assembly - Any combination of a fire door, frame, hardware, and other accessories, that together provide a specific degree of fire protection to the opening.

Fire Hazards Analysis (FHA) - An analysis to evaluate potential fire hazards and appropriate fire protection systems and features used to mitigate the effects of fire in any plant location.

Fire Loading - The amount of combustibles present in a given situation, expressed in BTUs per square foot ($BTU/ft^2$).

Fire Protection Feature – Administrative controls, fire barriers, means of egress, industrial fire brigade personnel, and other features provided for fire protection purposes.

Fire Rated Assembly - A passive fire protection feature that is used to separate redundant fire safe shutdown capabilities. A fire rated assembly includes fire rated walls, floors, ceilings, equipment hatches, stairwells, doors, dampers, and penetration seals.

Fire Rated Penetration Seal - An opening in a fire barrier for the passage of pipe, cable, etc., which has been sealed so as not to reduce the integrity of the fire barrier.

Fire Resistance Rating - The time that materials or assemblies have withstood a fire exposure in accordance with the test procedures of "Standard Methods of Fire Tests of Building Construction and Materials," NFPA 251.

Fire Severity - A unit of measure, in terms of time (hours or minutes) that is used to quantify the hazards associated with the fire loading in a given plant area. It is based on an approximate relationship between fire loading and exposure to a fire severity equivalent to the standard time- temperature curve. The fire loading of ordinary combustibles such as wood, paper, and similar materials with a heat of combustion of 7000 to 8000 BTU/lb is related to hourly fire severity. It should not be used with combustibles having a high heat-release rate.

Fire Scenario – A description of a fire and any factors affecting or affected by it from ignition to extinguishment, including, as appropriate, ignition sources, nature and configuration of the fuel, ventilation characteristics and locations of occupants, condition of the supporting structure, and conditions and status of operating equipment.

Fire Suppression - Control and extinguishing of fires. Manual fire suppression is the use of hoses, portable extinguishers, or manually-actuated fixed systems by plant personnel. Automatic fire suppression is the use of automatically actuated fixed systems such as water, Halon, or carbon dioxide systems.

Fire Wall - A wall having adequate fire resistance and structural stability under fire conditions to accomplish the purpose of subdividing buildings to restrict the spread of fire.

Fire Watch - A fire watch is a compensatory action used when fire protection systems or features are inoperable or impaired as required by the Technical Requirements Manual (TRM). Additionally, fire watches may be utilized for compensatory actions when limits are exceeded in administrative controls for areas (e.g., excessive transient fire loads).

Fire (Protection) Water Distribution System - The piping and appurtenances on Ginna property between a source of fire protection water and the base of the riser (flange of flange and spigot piece or base tee) for automatic sprinkler systems, fixed water spray systems, standpipe systems, and other water based fire suppression systems.

Fire Zone – A subdivision of a fire area not necessarily bounded by fire-rated assemblies.

Flammable Liquid - A liquid having a flash point below $100^0$F and having a vapor pressure not exceeding 40 lbs/in$^2$ (absolute) at $100^0$F shall be known as a Class I Liquid.

Foam-Water Sprinkler System - An extinguishing system, pipe connected to a source of air- foam concentrate, and a water supply, and appropriate sprinklers, that distributes foam and water over the protected area.

Free of Fire Damage – The structure, system, or component under consideration is capable of performing its intended function during and after the postulated fire, as needed.

Functional Test - The injection of a simulated signal into the sensor or device to verify the operability, including alarm and/or activation functions.

Internal Conduit Seals

a. Smoke and Hot Gas Seals - Noncombustible seals installed inside conduit openings to prevent the passage of smoke and hot gasses through fire barriers. These seals may be located at the fire barrier or at the nearest conduit entry on both sides of the fire barrier. Smoke and hot gas seals are not required to have a fire resistance rating equal to the fire barrier they are installed in. Refer to DA-ME-94-118-17, Fire Barrier Penetration Seal Qualification Analysis for Internal Conduit Seals (PENQ-17).
b. Heat and Fire Seals - Fire rated seals installed inside conduits at or in close proximity to the fire barrier. Heat and fire seals have the same or greater fire resistance rating as the fire barrier they are installed in.

Labeled - Equipment or materials to which has been attached a label, symbol or other identifying mark of an organization acceptable to the authorities having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

<u>Large Early Release</u> – Significant, unmitigated release from containment in a time frame prior to effective evacuation of the close-in population such that there is a potential for earl health effects.

<u>Listed</u> - Equipment or materials included in a list published by an organization acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials and whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

<u>Noncombustible Material</u> - A material which, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors, when subjected to fire or heat. Materials which are reported as passing ASTM E136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at $750^0$C, shall be considered noncombustible materials (NFPA 220).

<u>Operable-Operability</u> - A fire protection feature (i.e., system, subsystem, train, component, or device) shall be Operable when it is capable of performing its specified function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required by the systems, sub- systems, train, component, or device to perform its specified function(s) are also capable of per- forming their related support function(s).

<u>Penetration</u> - An opening through structural members or barriers such as walls, floors, or ceilings for passage of penetrating components.

<u>Penetration Seal</u> - Materials, devices, or assemblies installed in communicating spaces across barriers, which provide effective sealing against defined environmental exposure criteria to achieve the same functional requirement as that originally intended by the structural member or the barrier.

<u>Performance-Based Approach</u> – A performance-based approach relies upon measureable (or calculable) outcomes (i.e., performance results) to be met but provides more flexibility as to the means of meeting those outcomes. A performance-based approach is one that establishes performance and results as the primary basis for decision-making and incorporates the flowing attributes: (1) Measurable or calculable parameters exist to monitor the system, including facility performance; (2) Objective criteria to assess performance are established based on risk insights, deterministic analyses, and/or performance history; (3) Plant operators have the flexibility to determine how to meet established performance criteria in ways that will encourage and reward improved outcomes; and (4) A framework exists in which the failure to meet a performance criteria, while undesirable, will not in and of itself constitute or result in an immediate safety concern.

<u>Portable Fire Extinguisher</u> - A portable device containing powder, liquid, or gases which can be expelled under pressure for the purpose of suppressing or extinguishing a fire.

<u>Power Block</u> – Structures that have equipment required for nuclear plant operations.

| Ginna Power Block Definition | |
|---|---|
| **Power Block Structures** | **Fire Area(s)** |
| Reactor Containment Building | RC |
| Auxiliary Building | ABBM, ABI, CHG |
| Canister Preparation Building | ABI |
| Turbine Building | BOP |
| Control Building Complex | CC, BR1A, BR1B |
| Diesel Generator Building | EDG1A, EDG1B |
| Screen House | SH |
| Intermediate Building | ABI |
| Intake Structure | INTAKE |
| Standby Auxiliary Feedwater Pump Building | SAF |
| Cable Tunnel | CT |
| Primary Hydrogen Storage Building | PA |
| Secondary Hydrogen Storage Building | BOP |
| Nitrogen Storage Building | ABI |
| Service Building | BOP |
| Condensate Demineralizer Building | BOP |
| Transformer Yard | YARD |

Pre-action Sprinkler System - A system employing automatic sprinklers attached to a piping system connected to a water supply containing air that may or may not be under pressure, with a supplemental fire detection system installed in the same area as the sprinklers. Actuation of the fire detection system (as from a fire) opens a valve that permits water to flow into the sprinkler piping system and to be discharged from any sprinklers that may be open.

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

Risk – The set of probabilities and consequences for all possible accident scenarios associated with a given plant or process.

Risk Informed Approach – A philosophy whereby risk insights are considered together with other factors to establish performance requirements that better focus attention on design and operational issues commensurate with their importance to public health and safety.

Safe and Stable Conditions - For fuel in the reactor vessel, head on and tensioned, safe and stable conditions are defined as the ability to maintain $K_{eff}<0.99$, 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 $K_{eff}$<0.99 and fuel coolant temperature below boiling. Ginna defines safe and stable conditions for fuel in the vessel, head on and tensioned as the ability to maintain $K_{eff}$<0.99, with a reactor coolant temperature at or below the requirements defined by a hot shutdown plant operating state. The Ginna definition of hot shutdown is equivalent to the definition of hot standby typically used in the technical specifications of other PWRs ($K_{eff}$ <0.99 with Reactor Coolant Temperature at or above 350 $^0$F).

Safety-Related - Items that meet the following criteria:

Those functions that are necessary to ensure:

1. The integrity of the reactor coolant pressure boundary.
2. The capability to shut down the reactor and maintain it in a safe condition.
3. The capability to prevent or mitigate the consequences of an incident which could result in potential offsite exposures comparable to those specified in 10CFR100.

Smoke Detector - A device which detects the visible or invisible particles of incomplete combustion.

Sprinkler System - A network of piping connected to a reliable water supply that will distribute the water throughout the area protected and will discharge the water through sprinklers in sufficient quantity either to extinguish the fire entirely or to prevent its spread. The system, usually activated by heat, includes a controlling valve and a device for actuating an alarm when the sys- tem is in operation. Specific systems are manually actuated and do not contain a device for actuating an alarm when the system is in operation.

Spurious Operation – An unwanted change in state of equipment due to fire-induced faults (e.g., hot shorts, open circuits, or shorts to ground) on its power or control circuitry.

Standpipe and Hose System - An arrangement of piping, valves, hose connections, and allied equipment installed in a building with the hose connections located in a manner that the water can be discharged in streams or spray patterns through attached hose and nozzles, for the purpose of extinguishing a fire and so protecting a building and its contents in addition to protecting its occupants. This is accomplished by connections to water supply systems or by pumps, tanks and other equipment necessary to provide an adequate supply of water to the hose connections.

Testable Valves - Refers to valves such as OS&Y, butterfly and gate, (with or without automatic operators) that are designed to be cycled or exercised to ensure operation and prevent binding. This does not refer to valves such as check valves, solenoid valves, alarm test valves, or suppression system water flow alarm valves.

Thermal Detector - A device that detects abnormally high temperature or rate of temperature rise.

Thermistor - A type of detector that consists of metallic tubes with conductors in the center; the area between the center conductor and the outer metallic tube is packed with a thermally sensi- tive eutectic (resistance decreases as temperature increases) salt compound.(Training System Description (RGE-59), p.2)

Transient Fire Loads - Any combustible material that is not permanently present in a given area, and may be introduced during maintenance, repair, rework, or may be transported to a final des- tination for permanent installation or maintenance, repair, rework of equipment systems and components present there.

Water Spray Nozzle - A normally open water discharge device which, when supplied with water under pressure, will distribute the water in a special, directional pattern peculiar to the particular device.

Water Spray System - A special fixed piping system connected to a reliable source of fire pro- tection water supply and, equipped with water spray nozzles for specific water discharge and distribution connected to the water supply through an automatically or manually actuated valve which initiates the flow of water. An automatic valve is actuated by operation of automatic detection equipment installed in the same areas as the water spray nozzles. (In special cases the automatic detection equipment may also be located in another area.)

Water Supply - An arrangement of pumps, piping, valves, and associated equipment necessary to provide an adequate, reliable supply of water for the extinguishment of fires.

Wet Chemical - Normally an aqueous solution of organic or inorganic salts or a combination thereof that forms an extinguishing agent.

# 6.0 Fire Protection Quality Assurance

## 6.1 Quality and Performance Assessment (QPA) Program

The Quality Assurance Program is applied to the Fire Protection Program in accordance with the Quality Assurance Topical Report (QATR). The QATR provides specific QA requirements for fire protection features that provide protection for SSCs important to safety.

The Company's total program for providing administrative controls and quality assurance is incorporated in many diverse documents. The Company's nuclear document hierarchy describes the implementation of the QAP. Approved implementing procedures and instructions are written to the extent necessary to implement the quality requirements of 10CFR50 Appendix B. Line, staff, administrative, and quality oversight organizations issue and control these implementing procedures. All activities affecting quality are described in sufficient detail to assure quality.

## 6.2 Fire Protection Audits

Nuclear Oversight (NOS) is responsible for performing fire protection audits, assessments,

and surveillances in accordance with Nuclear Oversight assessment plans and procedures, and site specific Technical Specifications, Technical Requirement Manuals, and /or commitments (QA Topical Report NO-AA-10).

# 7.0 Fire Protection Organization (CC-AA-211)

## 7.1 Site Vice President

The site fire protection program is under the direction of the Site Vice President who has available the following staff knowledgeable in both fire protection and nuclear safety. The staff is responsible for the formulation, implementation, and assessment of the effectiveness of the program.

## 7.2 Site Engineering Director (SED)

1. Overall site management responsibility of the site Fire Protection Program.

2. Responsible for ensuring the preparation and maintenance of the site Fire Hazard Analysis and the Safe Shutdown Analysis, including any support documentation.

3. Establishes a Fire Protection "Technical Staff" that includes Fire Protection, System, and Design Engineers.

4. Designates an electrical engineer to support the Fire Protection Program Engineer, when necessary (i.e., Safe Shutdown Analysis Engineer).

## 7.3 Site Engineering Programs Manager (SEPM)

Responsible to oversee the implementation of the Fire Protection Program, as described in CC-AA-211.

## 7.4 Site Fire Protection Program Engineer

The Site Fire Protection Program Engineer is the site "program owner" of the fire protection program, in accordance with CC-AA-211.

The Fire Protection Program Engineer is responsible for the overall effective implementation and adequacy of the Fire Protection Program. Duties include:

1. Act as the station authority for all site-specific fire protection program issues (i.e., administrative control and design), and as technical consultant to other departments on design and programmatic issues.
2. Maintain the Fire Protection Program Report and support documents.
3. Maintain/Perform engineering evaluations, calculations, and design change reviews

required by the program.

4. Ensure the technical content of the site-specific post fire safe shutdown analysis and procedures, and the fire protection Technical Requirements Manual (TRM), or equivalent document, is adequate.
5. Interface with Corporate Fire Protection Program Engineer on design and program issues.
6. Lead site Fire Protection Focused Area Self-Assessment (PI-AA-126-1001).
7. Maintain Program Health Reports (ER-AA-1100) and Program Health Performance Indicators (ER-AA-610-1002) and respond to adverse trends or conditions.
8. Interface with NEIL inspectors during insurance inspections.

NOTE: NRC Guidance establishes an NRC Staff Position regarding the qualifications of the Site Fire Protection Program Engineer. While it is preferred that the Site Fire Protection Engineer satisfy this qualification, this qualification may also be satisfied via reliance on corporate support, other Exelon sites, or vendors as necessary.

In accordance with NRC Guidance Letter 77-02, “Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance”:

“The position responsible for formulation and implementation of the Fire Protection Program should have, within his organization, or as a consultant, a Fire Protection Engineer who is a graduate of an engineering curriculum of accepted standing and who shall have completed not less than six years of engineering attainment indicative of growth in engineering competency and achievement, three of which shall have been in responsible charge of fire protection engineering work. These requirements are the eligibility requirements as a Member in the Society of Fire Protection Engineers.”

## 7.5 Site Fire Protection System Engineer

Ensures the readiness of the fire protection systems in accordance with the site-specific System Engineering requirements and the responsibilities contained in applicable System Engineering procedures and guidelines (i.e. ER-AA-2030). Routine duties include:

1. Ensure the adequacy of system test procedures and material condition, including sponsoring improvements.

2. Support fire protection systems troubleshooting.

3. Implement the Maintenance Rule Program for fire protection systems, as applicable to each site.

4. Maintain an awareness of scheduled work affecting fire protection systems and

appropriately escalate concerns when work is not progressing according to expectation.

5. Maintain system health improvement reports.

6. Interface with Site and Corporate Fire Protection Program Engineers on system performance, maintenance, and testing issues.

7. Interface with NEIL inspectors during insurance inspections.

8. Review for analysis and trending station documented Fire Protection program testing and inspection activity results in accordance with the Conduct of Plant Engineering Manual (ER-AA-2030) and site-specific license renewal commitments.

9. Maintain System Notebook(s) for the applicable Fire Protection Systems

## 7.6 Site NFPA 805 Risk Engineer

The site NFPA 805 Risk Engineer, assists the site Fire Protection Program Engineer in maintaining configuration control of the NFPA 805 design, PRA, and licensing bases documents. Routine duties include maintaining the Fire PRA and performing NFPA 805 related risk evaluations associated with plant changes.

## 7.7 Site Operations Director

1. Ensures day-today implementation of the administrative controls regarding fire protection, prevention, and fire brigade readiness.
2. Responsible for resolution of transient combustible issues and concerns at the station.
3. Formulates and maintains the fire response and safe shutdown procedures.
4. Ensures that the minimum staffing required to implement post fire safe shutdown activities and staff the fire brigade is maintained on-site.
5. Ensures that operating personnel are trained on the post fire safe shutdown procedures.
6. Designates a Senior Reactor Operator (or equivalent) to support the Site Fire Protection Program Engineer, when necessary.
7. Delegates to the Shift Manager the responsibility for the safe operation of the plant, including responding to fire emergencies.
8. Ensures the Fire Marshal position is staffed.

## 7.8 Fire Marshal

The Fire Marshal is responsible for the effective implementation of the administrative controls regarding fire protection and prevention, and fire brigade readiness. Routine duties include:

1. Plant tours to monitor the effectiveness of fire protection administrative control and housekeeping practices.
2. Authorize and monitor fire protection system impairments (including insurance carrier notifications), hot work, and transient combustible control permits, and maintain

transient combustible log, as required by applicable administrative control procedures.

3. Ensure fire response readiness by coordinating fire brigade drills, maintaining the site-specific pre-fire plans, and ensuring fire brigade turnout gear and equipment is properly maintained.
4. Support the maintenance of agreements with local community agencies, as necessary. (Note: Emergency Preparedness has primary responsibility for this function).
5. Review scheduled fire related impairments, as necessary.
6. Ensure content for fire brigade, fire watch, and general employee training, and site-specific administrative control and fire response procedures are adequate.
7. Investigate and report fire incidents.
8. Interface with Site and Corporate Fire Protection Program Engineers on administrative control and fire brigade issues.
9. Interface with NEIL inspectors during insurance inspections.

## 7.9 Manager, Nuclear Training

Manager, Nuclear Training is responsible to ensure that the designated plant personnel attend appropriate firefighting training. In addition, the Training Manager shall assist the Fire Marshal in the administration and implementation of firefighting training and ensure that designated plant personnel who are considered to be fire watch qualified attend fire extinguisher training at the fire academy or equivalent facility annually.

## 7.10 Maintenance Planner

The Maintenance Planner is responsible for reviewing proposed work activities to identify potential hazards (i.e., transient combustibles, hot work, or fire system impairments) and ensuring that applicable fire protection administrative control requirements are established prior to performing the work activity.

## 7.11 Work Supervisor

The supervisor in charge of any work activity is responsible for ensuring that all applicable fire protection administrative control requirements are adhered to during the performance of a work activity.

## 7.12 Radiation Protection Manager

The Radiation Protection Manager is responsible for the maintenance and surveillance of the Self-Contained Breathing Apparatus (SCBA) provided for use by the site fire brigade.

## 7.13 Training Department

The Training Department is responsible for:

1. Developing, scheduling and providing training associated with the Fire Protection program, including initial and refresher fire brigade, NGET, hot work, fire watch and safe shutdown procedure training.
2. Establishing and maintaining training records.

## 7.14 Nuclear Oversight

Nuclear Oversight is responsible for performing fire protection audits, assessments, and surveillances in accordance with Nuclear Oversight assessment plans and procedures, and site specific Technical Specifications, Technical Requirement Manuals, and /or commitments (QA Topical Report NO-AA-10).

## 7.15 The Fire Brigade

The fire brigade consists of a total of five members:

1 Fire Brigade Captain (Equipment Operator formally known as Auxiliary Operator and Fire Brigade Trained with additional Captain
Training)

1 Fire Backup Brigade Captain (Equipment Operator and Fire Brigade Trained with additional
Captain Training)

1 Fire Brigade Member (Equipment Operator and Fire Brigade Trained)

1 Fire Brigade Member (Fire Brigade Trained)

1 Fire Birgade Member (Fire Brigade Trained)

This compliment excludes the two members of the shift crew necessary for safe shutdown. The fire brigade composition may be less than the minimum requirements for a period of time not to exceed 2 hours to accommodate for the unexpected absence of fire brigade members provided immediate action is taken to restore the fire brigade to the minimum requirements (Ref.4.2.12.10).

The fire brigade captain's responsibilities shall include:

a. Directing all firefighting activities at the scene of the fire.

b. Deciding when and if to call off site firefighting

personnel.

c. Keeping the control room informed of conditions

d. Maintaining knowledge and training to assess the fire's impact on safe shutdown capabilities related to safe shutdown fire areas.

## 7.16 Corporate Engineering Director (CED)

Has governance and oversight responsibility for fleet program implementation, assessment, and ongoing program activities.
The Corporate Engineering Director works with the Corporate Operations Director (COD) to ensure effective implementation of common policies, direction, and standardization. The CED also provides high-level direction and corporate approval of fire protection program plans and activities.

## 7.17 Corporate Engineering Programs Manager (CEPM)

The CEPM is responsible for overall management of the Corporate Fire Protection Program Engineer, cognizance of significant activities in the Program areas, and has line management governance/oversight responsibility for the program. Specific detailed responsibilities are described in ER-AA-1100.

## 7.18 Corporate Fire Protection Program Engineer

The Corporate Fire Protection Program Engineer is the corporate "program owner" of the fire protection program. The Corporate Fire Protection Program Engineer provides support to ensure the effective implementation of common policies, direction, and standardization. Specific responsibilities include:

1. Establish corporate policies and technical direction.
2. Develop and maintain standardized implementation of programs, processes, procedures, and standards (i.e., standardization plan).
3. Ensure timely communication and resolution of technical issues to all affected stations.
4. Ensure standards and methods for evaluating and reporting program health are developed.
5. Ensure best practices and industry experience are communicated and considered for implementation at all sites.
6. Ensure differing technical opinions between personnel are resolved.
7. Support/Oversight of site self-assessments. Review site self-assessment plans and results. Disseminate lessons learned throughout the fleet.
8. Manage participation in fire protection industry working groups, sub-committees and task forces. Forward information and results to sites for action or information, when appropriate.
9. Review and validate program indicator and health reports for each site in accordance with applicable policies and procedures.
10. Provide oversight, direction, review, and on-site support to sites to ensure successful external agency assessments and inspections.
11. Represent sites on fire protection industry working groups, including effective implementation of benefits derived.
12. Ensure major improvement projects and/or corrective actions are conducted and completed in a timely manner.
13. Develop standardized products to provide technical guidance and efficiencies for site use.
14. Provide on-site support to resolve complex or urgent issues.
15. Ensure pertinent fire protection information is contained in General Employee Training (NGET)
16. Support NEIL Engineering Advisory Committee (EAC)

## 7.19 Corporate Operations Director

Has governance and oversight responsibility for fleet program implementation, assessment, and ongoing program activities within the Operations Department.

The Corporate Operation Director works with the Corporate Engineering Director (CED) to ensure the effective implementation of common polices, direction, and standardization.

Provides high-level direction and corporate approval of fire protection program activities associated with the Operations Department.

## 7.20 General Responsibilities of the Plant Staff

The general responsibilities of the Plant Staff include the following:

a. Ensure their section observes good safety practices in the use and control of combustible materials, restricting the accumulation of unneeded combustibles and the use or control of equipment that may be an ignition source.

b. Ensure that transient combustibles are not taken into safety related areas without prior approval from the Fire Marshal or designee.

c. Ensure that personnel under their jurisdiction attend training sessions on fire prevention as scheduled by the Department Manager, Nuclear Training.

d. Ensure activities under their jurisdiction are carried out in a manner that does not endanger essential plant equipment, cabling, piping or instrumentation necessary for the safe operation of the plant. If any activities which involve the use of combustibles or ignition sources are scheduled in safety related areas, then consideration must be given to deferring that activity until the next shutdown.

e. Responsibility for charging the Supervisors or lead personnel within their section for housekeeping in all work areas (job sites) where work is performed. The areas should be inspected by the supervisor or lead person at least daily or when job is complete (whichever comes first). This will ensure that all groups are cleaning up following work activities.

f. Ensure personnel adhere to No Smoking rules.

g. Ensure all wood products (including wood smaller than 6" x 6", boxes, staging forms, construction lumber, shelves and benches) are fire retardant treated.

h. Ensure that all lumber purchased has been fire retardant treated. Any exceptions shall be approved by the Fire Marshal or designee.

i. Ensure that all fire protection equipment and cabinets are kept clear of obstructions. All fire protection equipment includes the following:

   1. Fire protection suppression systems;
   2. Detection system panels;
   3. Extinguisher stations;

4. Manual hose reels;
5. Dry chemical extinguisher devices and foam extinguisher devices;
6. Plant fire dampers (utilizing wall openings with fire dampers to route temporary cabling or other materials is not allowed unless approval is provided by the Fire Marshal or designee.)
7. Fire wrap materials;
8. Plant fire doors. Fire doors, in most cases, are normally closed. If activities require that a fire door(s) be held open, fire protection shall be notified. Fire protection would complete required compensatory measures and notify the Control Room to initiate an A-52.12 for TRM or Appendix R/NFPA 805 credited fire doors. Plant personnel shall notify fire protection upon completion of the work activities so that compensatory measures can
   be discontinued once operability is verified. Fire protection shall notify the Control Room to close-out the A-52.12, compensatory measures shall be discontinued after the A-52.12 is closed out by Operations. Property conservation required fire doors and fire dampers are also required to be unobstructed and require the approval of the Fire Marshal or designee if they are to be impacted, so that any applicable compensatory measures can be implemented.

   The plant is also provided with roll-up fire doors which are normally open. By design, these fire doors/fire dampers close automatically to maintain the fire barrier integrity. The areas below roll-up fire doors or dampers cannot be occupied with any tools, equipment or other materials which would prevent the door or fire damper from fully closing. If the area below a fire door is required to be obstructed, fire protection shall be notified to initiate the appropriate compensatory measure and fire protection shall notify the Control room to initiate an A-52.12 for TRM or Appendix R/NFPA 805 credited fire doors. Plant personnel shall notify fire protection upon removal of the materials which obstruct the fire door(s) so that the compensatory measures can be discontinued once operability is verified and Operations provides approval to suspend compensatory measures. Fire protection shall notify the Control Room to close-out the A-52.12. Compensatory measures will be discontinued after closeout of the A-52.12 by Operations and notification to fire and safety is provided.

J. Ensure that open flame or combustion generated smoke devices are not used for leak testing.

k. Ensure any problems with fire systems or the Fire Program are reported to the Fire Marshall or Fire Protection System Engineer and an Issue Report (PI-AA-120) is initiated. Ensure all problems are identified and corrected and evaluated for reportability to the NRC as appropriate.

l. Ensuring that exterior hydrants, exterior hose cabinets and post indicating valves are kept clear of snow accumulations which could limit access.

## 7.21 Qualifications of Personnel

Ginna Station shall employ a Fire Protection Engineer who is a graduate engineer with a minimum six years engineering experience of which at least 3 have been spent in fire protection engineering work. Outside fire protection consultants may be utilized to supplement his skills. All fire brigade personnel shall receive an annual physical examination (Ref. 4.2.12.5). Maintenance shall be done by Maintenance Department Personnel, Exelon Fleet Personnel or Contractor Personnel. All of these personnel shall be trained and experienced to do this work.

The Ginna Station Fire Marshal's qualifications should include firefighting experience. Training courses such as the Niagara Mohawk Fire Training School instructors' classes, Monroe County Fire Training Center and state training school classes or equivalent shall be attended annually and utilized to keep the Fire Marshal and program personnel up to date.

## 8.0 Fire Protection Program Administrative and Technical Controls

This section of the Ginna Station Fire Protection Plan provides the administrative process and controls for implementation of the Fire Protection Program.

## 8.1 Program Changes and Associated Review and Approval (LS-AA-128-101)

A regulatory review of the proposed changes to the approved Fire Protection Program (LS-AA-128-101) is required to be performed to determine if a proposed change to the approved fire protection program (AFPP) can be made without prior NRC approval.

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, changes may be made to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR50.48(a) and 10 CFR50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed within LS-AA-128-101 is satisfied.

As described in LS-AA-128-101, a plant change evaluation is a required step in the methodology for all changes to previously approved fire protection elements that are not considered trivial. NFPA 805 states that:

> "*In the event of a change to a previously approved fire protection program element, a risk-informed plant change evaluation shall be performed and the results used as described in [NEI 04-02] 2.4.4 to ensure that the public risk associated with fire-induced nuclear fuel damage accidents is low and that adequate defense-in-depth and safety margins are maintained.*"

A 10CFR50.59 review is not required if the proposed change is limited to fire protection. If the proposed activity involves aspects other than fire protection, then additional regulatory review, including a 10 CFR50.59 evaluation, may be required to determine if the proposed activity can be implemented without prior NRC approval (i.e., refer to LS-AA-104-1000).

Documents that may be affected by changes to the approved fire protection program, typically include, but are not limited to the: UFSAR and applicable appendices, Fire Protection Program Report, NFPA 805 Design Basis Documents, Fire Protection Program design input analyses, Fire Protection Implementing procedures, Fire Protection section of the TRM, Fire Protection drawings, Fire Protection system setpoints, and Fire Protection commitments (including those contained in SERs and docketed correspondence).

## 8.2 Updates to the FPPR

Administrative controls shall be established and maintained to control updates to the FPPR. This includes the use of plant procedures to control updates to the FPPR. Administrative requirements should be established for the review and approval of changes to the FPPR. Procedures CC-AA-209, and IP-FPP-1 provide required directions.

## 8.3 Control of Combustibles

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 per NFPA 805 Chapter 3, section 3.3.

A fire prevention program has been established, documented, and implemented as part of the overall Ginna fire protection program. The basic components are:

1. Controls on Operational Activities: OP-AA-201-004, Fire Prevention for Hot Work, and OP-AA-201-006, Control of Temporary Heat Sources, and OP-AA-201-009, Control of Transients.
2. Combustible materials Design Controls: CC-AA-102, Design Input and Configuration Change Impact Screening.

## 8.4 Control of Ignition Sources

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 per NFPA 805 Chapter 3, section 3.3.1.

Procedures are in place that adequately control ignition sources (OP-AA-201-004, Fire Prevention for Hot Work). The control of transient combustible materials are governed by OP-AA-201-009, and the aim to minimize the size of fires that may occur during all aspects of plant operations is included in SC-3.3.1, Immediate Fire Notification, and other Site Contingency procedures (SC-3 series, Site Contingency Plan).

## 8.5 Modification Review

A review of all station modifications and procedure changes for possible impact on specific NFPA 805, NEIL property loss control standards, configuration change, fire protection change, or the Nuclear Safety Capability Assessment (NSCA) shall be performed by assigned Engineering Department personnel. An approved procedure shall describe the method to perform such a review. A modification may be implemented only after satisfactory review has been completed. Procedure CC-AA-102 and CC-AA-209 provide the required guidance.

# 9.0 Fire Brigade Equipment and Fire Response

## 9.1 Fire Brigade Requirements

One of the major elements in Ginna Stations Fire Protection Program is its plant fire brigade. An adequately manned, fully trained, fire brigade shall be available on site at all times.

**Brigade Availability**
In accordance with NFPA 805 section 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 NFPA 600. Additionally, NFPA 805 section 3.4.1 (b) requires that the fire brigade members shall have no other assigned normal plant duties that would prevent immediate response to a fire or other emergency as required.

Administrative controls are established to ensure that a Fire Brigade of at least five members is maintained onsite at all times. The Fire Brigade does not include members of the shift crew necessary for post fire safe shutdown, the Shift Technical Advisor (STA), or any personnel required for other essential functions during a fire emergency. The Fire brigade composition may be less than the minimum requirements for a period of time not to exceed two (2) hours in order to accommodate unexpected absence provided immediate action is taken to fill the required positions in accordance with procedure CC-AA-211.

The fire brigade consists of a total of five members:

- (1) Fire Brigade Captain (Equipment Operator formally known as Auxiliary Operator and Fire brigade Trained with additional Captain Training
- (1) Backup Fire Brigade Captain (Equipment Operator and Fire Brigade Trained with additional Captain Training)
- (1) Fire Brigade Member (Equipment Operator and Fire Brigade Trained)
- (1) Fire Brigade Member (Fire Brigade Trained)
- (1) Fire Brigade Member (Fire Brigade Trained)

**Physical Requirements**
In accordance with NFPA 805 section 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.

Administrative controls are in place to examine and certify fire brigade members, and candidates, who are expected to perform fire-fighting activities, that they are medically and physically fit by an Occupational Health Services (OHS) licensed healthcare professional

annually in accordance with procedure HR-AA-07-107.

## 9.2 Fire Brigade Equipment

Fire brigade equipment is provided in the fire brigade fire response room of the plant for use by the plant fire brigade. It is stored and maintained in accordance plant procedure SC-3.15.15, Emergency Fire Locker Inventory and Inspection. The Site Support Emergency Vehicle is also equipped with required equipment which is also stored and maintained in accordance with procedure SC-3.15.15.

Examples of the types of fire brigade equipment available are as follows:

- Portable ventilation equipment
- Fire extinguishers
- Self-contained breathing apparatus and reserve air bottles
- Fire hose
- Nozzles, gated wyes, and fittings
- Personal protective equipment such as turn-out coats, bunker pants, gloves, and helmets
- Communication equipment
- Portable lights
- Ladders

## 9.3 Fire Brigade Training

NOTE: Compliance with NFPA 805 Chapter 3, section 3.4.3 (Training and Drills) is documented in Appendix B.

Plant industrial fire brigade members receive training consistent with the requirements contained in NFPA 600. Ginna complies with NFPA 600 as evaluated in code compliance evaluation 51-9159544 (reference 4.3.4.18).

Industrial fire brigade members are given quarterly training and practice in firefighting, 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. Ginna fire brigade members are given quarterly training which includes classroom training and fire drills in accordance to procedure OP-AA-201-005, Fire Brigade Qualification.

The classroom instruction generally includes:

a. Identification of the fire hazards and associated types of fires that could occur in the plant and an identification of the location of such hazards.

b. Identification of the location of firefighting equipment for each fire area and familiarization with layout of the plant including access and egress routes to each area.

c. The proper use of available firefighting equipment and the correct method of fighting each type of fire. The types of fires covered include electrical fires, fires in cables and cable trays, hydrogen fires, flammable liquids and chemicals, waste/debris fires and record file fires.

d. Indoctrination to the plant firefighting plan with specific coverage of each individual's responsibilities.

e. The proper use of communication, lighting, ventilation and emergency breathing equipment.

f. The direction and coordination of the firefighting activities (fire brigade leaders only).

g. The toxic characteristics of expected products of combustion.

h. The proper method for fighting fires inside buildings and confined spaces including a review of rescue practices and forcible entry methods.

i. Detailed review of firefighting strategies (fire response plans), procedures and procedure changes. (Section 9.4)

J. Review of latest plant modifications as they affect firefighting plans.

Instruction shall be done by qualified instructors who shall be knowledgeable, experienced and suitably trained in fighting the type of fires that could occur in the plant and in the types of equipment available at Ginna Station.

Training is based on NFPA 600 (ref. 4.2.12.5), and is conducted at least quarterly for all brigade members. Compliance of Fire Brigade operations with the applicable requirement of NFPA 600 – 2000 edition, has been assessed and documented by ref. 4.3.4.18 to include:

a. Review of changes to the fire protection and prevention program, fire protection systems and other relevant fire protection and prevention subjects.

b. Refresher training sessions to repeat the classroom instruction program over a two year period.

Practice sessions are included in the training sessions for each shift fire brigade member. Proper methods of fire fighting the various types of fires which could occur at the plant shall be taught and practiced. Emergency breathing apparatus and fire hoses are utilized in these sessions.

Fire brigade drills are performed in accordance with plant procedures. To the extent practical, drills shall include brigade response to fire alarms, use and selection of fire fighting equipment, various fire fighting situations such as size and arrangement of a fire and the brigade leader's direction of fire fighting efforts.

Drills are conducted for each shift brigade, quarterly with one drill per year held on a back shift (Ref. 4.2.12.5). At least one drill per year shall be performed by each shift member. There is one unannounced drill per year, involving each shift brigade to determine the fire readiness of the plant fire brigade, fire protection system and equipment. In addition, drills involving offsite fire departments are conducted annually which, at a minimum, requires a communication test.

Drills are pre planned to establish the training objectives of the drill. The drills are critiqued to determine how well the training objectives have been met. Unannounced drills have their critiques performed by members of the plant staff responsible for plant safety.

Records of training provided to each fire brigade member, including drill critiques, are maintained to assure that each member receives training in all parts of the training program in accordance with NFPA 805 section 3.4.3 (c). These records of training shall be retained minimally for three years in accordance with OP-AA-201-003.

## 9.4 Fire Fighting Procedures

Note: Compliance with NFPA 805 Chapter 3, section 3.4.2 (Pre-Fire Plans) along with associated sub-sections is documented in Appendix B.

Procedures have been written to cover notification of a fire, fire emergency procedures and coordination of fire fighting activities with offside fire departments. These procedures identify the following:

a. Actions to be taken by an individual discovering the fire, such as notification of Control Room, attempt to extinguish fire if trained, and activation of local fire suppression systems.

b. Actions to be taken by the Control Room Operator and the need for fire brigade assistance upon report of a fire or receipt of alarm on the Control Room annunciator panel, such as announcing the location of the fire over the PA system, sounding fire alarms and notifying the Shift Supervisor of the type, size and location of the fire.

c. Actions to be taken by the fire brigade after notification by the control room operator of the fire, including the location to assemble, directions given by the Fire Brigade Captain, and responsibilities of Brigade members such as selection of fire fighting equipment and transportation to the fire location, selection of protective equipment and use of fire suppression systems and operating instructions.

d. Strategies established for fighting fires in all safety related/safe shutdown areas and areas presenting a hazard to safety related/safe shutdown equipment. The strategies cover the following subjects:

    1. Identification of combustibles in each plant zone covered by the specific fire fighting procedures.
    2. Fire extinguishants best suited for controlling the fires associated with the combustible loadings in that zone and the nearest location of these extinguishers.
    3. Most favorable direction from which to attack a fire in each area, in view of the ventilation, access hallways, stairs and doors which are most likely to be fire free and the best station or elevation for fighting the fire. A specific identification system designates all hallways, stairs, doors, fire equipment and system fighting procedures. All access and egress routes that involve locked doors shall be specifically identified with the appropriate precautions and methods for access specified.
    4. Designation of plant systems that should be managed to reduce the damage potential during a local fire; location of local and remote controls for such management (i.e. any hydraulic or electrical system in the zone covered that could increase the hazard in the area because of over pressurization or electrical hazards).
    5. Designation of vital heat sensitive system components that should be kept cool while fighting a local fire. Critical equipment which may be a particularly hazardous combustible source shall be designated to receive cooling.
    6. Organization of fire fighting brigade functions (covered by any complete shift personnel complement). Their duties shall include command and control of the brigade, fire hose laying, applying the extinguishant to the fire, advancing support supplies to the scene, communication with the control room and coordination with outside fire depart-

ments.

7. Identification of radiological and toxic hazards in fire zones.

8. Ventilation system operation that assures desired plant pressure distribution when the ventilation flow is modified for fire containment or smoke clearing operation.

9. Operations requiring Control Room and Shift Supervisor coordination or authorization.

10. Instructions for plant operators and general plant personnel during fire.

11. Identification of safe shutdown equipment in the area and the redundant equipment or alternate shutdown capability available to perform that function.

**NOTE:** The validity of the preplanning strategies are tested by appropriate drills to check the strategy logic, the equipment adequacy, the personnel understanding and to identify unforeseen problems.

e. Actions to be taken by the Plant Manager, Ginna Station, and his staff and security guards after notification of a fire.

f. Actions to be taken that will coordinate fire fighting activities with offsite fire departments, including identification of the individual responsible for assessing the situation and calling in outside fire department assistance when needed; identification of the individual who will direct the fire department activities when aided by offside fire fighting organizations in fire brigade drills at least once per year; and provisions for training offsite fire department personnel in basic radiation principles, typical radiation hazards, and precautions to be taken in a fire involving radioactive materials in the plant.

# 10.0 Fire Protection Systems and Features

## 10.1 Introduction

The Fire Protection System detects potential fires or fire conditions in selected risk areas and automatically actuates the appropriate alarms, dampers, and suppression systems. The system minimizes the adverse effects of fire on structures, systems, and components important to safety. The Fire Protection System is comprised of fire detection equipment, fire suppression systems, fire barriers, and fire prevention and mitigation design.

Fire detection equipment is provided in all areas containing safety-related equipment or large amounts of combustibles. This equipment provides early warning alarms and actuation of suppression systems. In addition, signals are transmitted indicating water flow in suppression systems, fire pump operation, fire pump trouble, low fire water tank level or pressure, and valve tampering.

Fire suppression is provided by fixed water deluge pre-action or sprinklers, fixed Halon 1301, Wet Chemical System, hose lines, and portable extinguishers. The Fire Service Water System is supplied by redundant electric and diesel driven fire pumps to ensure that pressure and water flow requirements of the automatic and manual suppression systems are maintained. The Yard (off-site) Fire Water System is supplied by the Ontario Water District. This system can be cross-connected with the Fire Service Water System so that the manual hose stations and some automatic suppression systems can be supplied if both on-site pumps should fail. Water spray shields are provided in the Intermediate Building over the CRD, MCC and switchgear, and in the Auxiliary Building over switchgear, MCCs, and other electrical equipment to prevent equipment damage from the application of fire water.

Fire barriers are located throughout the plant to separate major areas from each other and also to separate certain safety areas from the remainder of the plant. These are designed to stop a fire from propagating from one area to the other. All penetrations in these barriers are sealed with appropriate materials to match or exceed the requirements of the barrier.

Fire prevention and mitigation is included in the design of the ventilation system, drain system, lighting system, communication system, electrical and instrumentation cables, layout and material, and oil collection systems. Additionally, administrative controls are implemented to prevent accumulation of combustible material and to practice good safety methods.

# 10.2 Fire Protection System Descriptions

## 10.2.1 Detection Equipment

Plant fire detection equipment transmits fire alarm, supervisory, and trouble signals to the Control Room. This includes smoke detectors, heat detectors and tamper switches. These detectors are supervised to detect and annunciate circuit breaks, ground faults, and power supply failures.

Two types of smoke detectors are used: Ionization and Photoelectric. In an Ionization-type detector a small alpha emitter is used to ionize air in the detector region, and current passes through the ionized air. As smoke enters the detector it reduces the number of free ions and consequently reduces detector current flow; this situation is sensed as an alarm. A disadvantage of Ionization detectors is their insensitivity to smoke from smoldering fires. Photoelectric light scattering detectors utilize a light source and photocell arranged in a chamber so that light will not reach the photocell. As smoke enters the detector and scatters the light, the photocell detects the light and alarms at a preset value. Photoelectric detectors are sensitive to smoke from smoldering fires but provide slow response to flaming fires.

Four types of heat detectors are used: RTD, thermoelectric, containment cable trays and RCP motor stator area thermistors, and thermopneumatic. RTDs measure resistance, resistance varies proportional to temperature. RTDs are used to monitor containment charcoal filters, 1-G Filter, and Control Room wall.

Thermoelectric detectors work on Cable Tunnel, Control Room Kitchen, Condenser Pit, and Seal Oil Unit.

Thermistors consist of metallic tubes with conductors in the center; the area between the center conductor and the outer metallic tube is packed with a thermally sensitive eutectic (resistance decreases as temperature increases) salt compound.

Detectors are connected to a unit which applies a small voltage. When an overheat condition occurs anywhere along the detector, the resistance of the eutectic drops, causing current to flow between the center conductor and the outer metallic tube. The control panel senses this current flow and alarms at a preset value. Thermistors rate high on reliability, stability, and maintainability, but low on sensitivity. Thermistors are used in Basement Cable Trays, RCP 4KV trays, Intermediate Floor Trays, and Operating Floor Trays.

Thermopneumatic detectors provide rate of temperature rise actuation of automatic deluge systems. As the temperature of the detector increases, the pressure increases, actuating the release. These detection circuits are designed to override pressure variations resulting from normal changes in ambient temperatures and yet react to fire-generated pressure to actuate the fire protection system to which they are connected. Thermopneumatic detectors are for the oil storage room area.

Fire Service Water pressure is monitored to control Fire service Water Tank pressure and both fire pumps. Pressure is indicated in the Control Room at the Auxiliary Benchboard. Fire Service Water Tank level is monitored to control the Fire Service Water Booster Pump and to provide level indication at the Auxiliary Benchboard.

Fire Service Water flow is monitored to provide suppression system flow indication at the Fire Control Panels.

Valve position of selected Fire Service Water valves is monitored by position switch to provide alignment/tamper indication at the Fire Control Panels.

## 10.2.2 Fire Control Panels

Fire Control Panels (FCP) provide fire zone and equipment status and the capability to manually actuate the suppression systems. The Graphic Display Panel, located at the top of FCP1, is a mimic board showing suppression system status including valve position, pump operation (when connected), flow, and header pressure. The remainder of FCP1 and FCP2 contain annunciators (which indicate fire detection zone and fire suppression system status), manual suppression system actuation keyswitches, alarm reset keyswitches, and silence and lamp test pushbuttons.

The annunciation and controls available at the Fire Control Panels include the following:

<u>ALARM</u> - (Fire Detection Zone or Fire Suppression System) - annunciates if one or more smoke and/or heat detectors have sensed a fire in that zone or fire suppression system.

<u>FIRST ALARM</u> - annunciates if one smoke or one heat detector has sensed a fire in its suppression system.

<u>SECOND ALARM</u> - annunciates if two or more smoke and/or heat detectors have sensed a fire in their suppression system. This automatically actuates the suppression system unless the automatic actuation has been defeated.

<u>FLOW</u> - annunciates on suppression system flow.

<u>VALVE TAMPER</u> - annunciates when a suppression system isolation valve is mis-positioned or its supervision is interrupted.

<u>AUTO DEFEAT</u> - annunciates when the automatic actuation capability of a suppression system has been defeated.

<u>MANUAL CONTROL</u> (keyswitch) - allows for manual actuation of suppression systems.

<u>TROUBLE</u> - lights if there is a problem with a supervisory circuit, valve tamper, smoke detector pre-alarm, auto defeat, or high charging rate at the Satellite Station battery.

<u>POWER</u> - power is available to the FCPs.

<u>TAMPER RESET</u> (keyswitch) - allows reset of the valve tamper annunciation when the valve has been returned to its proper position.

<u>ALARM RESET</u> (keyswitch) - allows reset of fire or suppression system alarms if the condition is cleared.

<u>SILENCE</u> (pushbutton) - acknowledges visual alarm and silences audible alarm. Visual alarm remains lit until reset.

<u>LAMP TEST</u> (pushbutton) - lights all alarm indicators to verify bulb operability.

## 10.2.3 Allison Controls Panel

The Allison Controls Panel monitors heat detectors in Containment. Alarm outputs from this panel are sent to Satellite Station A (SSA). Smoke detection is photoelectric type and heat detection is by Thermistor type. The Allison Controls Panel is located in the Turbine Building Basement adjacent to the Iso Phase Bus Duct Cooler.

## 10.2.4 Pyrotronics

The Pyrotronics portion of the Fire Protection System consists of a Fire Indicating Unit (FIU) and three Zone Indicating Units (ZIU). The Fire Indicating Unit provides DC power to the detectors and Zone Indicating Units; it also controls fire alarm and trouble signals with outputs to Satellite Station A. Power is supplied to the Fire Indicating Unit by a manual transfer switch in the left section of the MCB just inside the door at ankle height. Normal power is 1A Instrument Panel (switch 12); backup power is 1C Instrument Panel (switch 10).

Zone Indicating Units provide indication of alarm/trouble for the areas' monitors. The Pyrotronics system monitors the Auxiliary Building Ventilation System.

## 10.2.5 Panels

<u>Sensitivity Test Panels (STP)</u>

Sensitivity Test Panels are located throughout the plant to permit sensitivity testing of all smoke detectors, with the exception of the Containment and RHR (Allison) smoke detectors. Sensitivity testing allows early detection of dust buildup within the detectors (dust buildup reduces detector sensitivity). Each STP or group of STPs is equipped with a remote test station (RTS) to facilitate testing.

The annunciation and controls available at the STP and RTS include the following:

(Red) <u>ALARM</u> light - indicates an alarm condition for smoke detectors. This should also be indicated as an alarm at the FCP.

<u>POWER ON</u> - this light is on when power is available at the STP.

<u>LAMP TEST</u> pushbutton - used to verify alarm and pre-alarm light operability.

<u>TEST JACKS</u> - used to connect the voltmeter for measuring detector sensitivity.

<u>Smoke Detection Control Panel (SFP-7)</u>

The Z16 Smoke Detection panel (SFP-7) is the controller of the smoke detectors located in Containment. SFP-7 is a Simplex 4006 Fire Alarm Control Panel. It is comprised of one cabinet in the Turbine Building Basement adjacent to the Allison Controls Panel and the Iso Phase Bus Duct Cooler. SFP-7 receives input from Z16 smoke detectors located in containment and panel pushbuttons. SFP-7 provides output to SSA in the Relay Room. SFP-7 has its own internal battery for backup power.

Controls on SFP-7:

ALARM ACK – Acknowledge any unacknowledged fire alarms in the system, scrolls through the alarms in the Active List, and silences the audible alarm chime.

SUPV ACK – Not used.

TROUBLE ACK – Acknowledges any unacknowledged troubles in the system, and scrolls through the trouble conditions in the active Trouble List.

ALARM SILENCE – Not used.

SYSTEM RESET – Pressing the SYSTEM RESET key will only attempt to return the system to normal, non-alarm state. All outputs to SSA that were activated by the alarm will remain active until all alarm inputs have been restored and the reset was able to successfully complete.

ALPHANUMERIC DISPLAY – Provides descriptions of alarm zone, trouble condition, and automatically changes as the status of each condition changes.

FIRE ALARM LED – Indicates the presence of an unacknowledged alarm condition, along with electronic chime. The ALARM ACK key silences the audible chime. The FIRE ALARM LED will remain illuminated until the alarm condition clears and the system is reset.

SYSTEM SUPERVISORY LED – Not used.

SYSTEM TROUBLE LED – Indicated the presence of trouble conditions such as circuit break, circuit ground, of battery charger trouble along with an audible chime. The TROUBLE ACK key silences the audible chime. The SYSTEM TROUBLE LED will automatically extinguish when the trouble condition is cleared.

ALARM SILENCE LED – Not used.

AC POWER LED – Indicates the presence of normal AC power at the panel.

MENU – Allows accesses the main menu structure unless the panel is in the Programming menu.

FUNCTION – Provides access to commonly used control and display functions

DISABLE/ENABLE – Allows the operator to quickly disable or enable any point that is currently displayed. This key is pass-code protected.

EXIT/CLEAR – Used to back out of menus or displays and return to the top-level menu structure.

Smoke Detection Control Panel (SFP-8)

The S52 Smoke Detection Panel (SFP-8) is the controller of the smoke and heat detectors located in the Standby Auxiliary Feedwater Bulding (SAFW). SFP-8 is a Simplex 4010ES Fire Alarm Control Panel. SFP-8 is located in the SAFW Annex on the north side of the diesel generator room. SFP-8 receives input from SFP-9 located in the SAFW Building. SFP-8 provides output to SSC in the Relay Room. SFP-8 has its own internal battery for backup power.

Controls on SFP-8:

FIRE ALARM ACK – Acknowledge any unacknowledged fire alarms in the system, scrolls through the alarms in the Active Alarm List, and silences the audible alarm chime.

PRIORITY 2 ACK – Not Used.

SUPV ACK – Not Used.

TROUBLE ACK – Acknowledges any unacknowledged troubles in the system, and scrolls through the trouble conditions in the active Trouble List.

ALARM SILENCE – Silences all active local and area alarms.

SYSTEM RESET – Pressing the SYSTEM RESET key will only attempt to return the system to a normal, non-alarm state. All outputs to SSC that were activated by the alarm will remain active until all alarm inputs have been restored and the reset was able to successfully complete.

ALPHANUMERIC DISPLAY – Provides descriptions of alarm zone, trouble condition, and automatically changes as the status of each condition changes.

FIRE ALARM LED – Indicates the presence of an unacknowledged alarm condition, along with electronic chime. The ALARM ACK key silences the audible chime. The FIRE ALARM LED will remain illuminated until the alarm condition clears and the system is reset.

SYSTEM SUPERVISORY LED – Not used.

SYSTEM TROUBLE LED – Indicates the presence of trouble conditions such as circuit break, circuit ground, or battery charger trouble along with an audible chime. The TROUBLE ACK key silences the audible chime. The SYSTEM TROUBLE LED will automatically extinguish when the trouble condition is cleared.

ALARM SILENCE LED – Indicates that the silence switch has been used. Alarm silence LED will clear automatically if the sytem has any new alarm actuation.

AC POWER LED – Indicates the presence of normal AC power at the panel MENU – Allows access to the main menu structure unless the panel is in the Programming menu.

FUNCTION – Provides access to commonly used control and display functions.

DISABLE/ENABLE – Allows the operator to quickly disable or enable any point that is currently displayed. This key is pass-code protected.

EXIT/CLEAR – Used to back out of menus or displays and return to the top-level menu structure.

Suppression Releasing Panel (SFP-9)

The S52 Suppression Releasing Panel (SFP-9) is the controller of the S52 preaction suppression system located in the Standby Auxiliary Feedwater Building (SAFW). SFP-9 is a Simplex 4090 suppression releasing device. SFP-9 is located in the SAFW Annex on the north side of the diesel generator room. SFP-9 receives input from S52 smoke and heat detectors and suppression signals located in the SAFW Building. SFP-9 provides output to SFP-8 in the SAFW Annex.

Controls on SFP-9

None – SFP-9 is an enclosed cabinet. All controls for S52 are provided on SFP-8.

### 10.2.6 Satellite Stations

The Satellite Stations are the controllers of the Fire Protection System. They are comprised of seven cabinets at three locations: Satellite Station A (SSA), with four cabinets, in the Relay Room; Satellite Station B (SSB), with one cabinet, in the Control Room; and Satellite Station C (SSC), with two cabinets, in the Relay Room opposite SSA. The Satellite Stations provide the capability of testing without actuation of suppression systems, overriding of automatic suppression system actuation, and manual actuation of suppression systems. The Satellite Stations receive inputs from: smoke and heat detectors, all supervised valves; system pressure, suppression system flow, pump monitors (when connected); all key switches, and all test pushbuttons. The Satellite Stations provide outputs to: initiate automatic suppression, initiate manual suppression, initiate audible and visual pre-alarms/alarms, indicate flow status, and indicate fire locations. SSA monitors all areas of the plant except the Relay Room. SSB monitors SSA and SSC and the Relay Room. SSC monitors valve positions, smoke detection zones Z40 and Z41 in the Turbine Building, Z42 and Z43 in the Battery Rooms and Z44 in the Relay Room Annex. All Satellite Stations are normally powered by the B Instrument Bus. Back-up power to SSA and SSC is from batteries in Battery Room "B"; and SSB has its own internal battery for back-up power.

The annunciation and controls available to the Satellite Stations include the following

Controls on FCP1:

<u>LAMP TEST</u> - Illuminates indicators on FCP1 and inhibits the trouble resound capability of SSA and SSB while it is depressed. This pushbutton is used to prevent the reset of SSB from causing a trouble condition.

<u>ALARM</u> - Indicates a fire detection zone is in alarm.

<u>FIRST ALARM</u> - Indicates that the first smoke or heat detector in a fire suppression system is in alarm.

<u>SECOND ALARM</u> - Indicates that a second smoke or heat detector in a fire suppression system is in alarm. This causes automatic actuation unless the system is in "Auto Defeat".

<u>FLOW</u> - Indicates that water or Halon flow has been detected in a fire suppression system.

<u>VALVE TAMPER</u> - Indicates that a water suppression system gate valve has been tampered with.

<u>AUTO DEFEAT</u> - Indicates that the automatic function of a fire suppression system has been defeated.

<u>MANUAL ACTUATION</u> keyswitch - Causes manual actuation of a fire suppression system.

Controls on FCP2:

<u>LAMP TEST</u> - Illuminates indicators on FCP2 and inhibits the trouble resound capability of SSA and SSB while it is depressed.

<u>TROUBLE INDICATOR (WHITE)</u> - Indicates that SSB is in trouble condition.

SSC ONLY POWER - Indicates that SSC is powered by AC or DC.

SSA ONLY POWER - Indicates that SSA is powered by AC or DC.

SILENCE - Remotely acknowledges fire alarms on SSA, SSB and SSC, and silences all audible devices including FL, FLA, and FLC in the Control Room, and FK and FKC in the Relay Room.

SSA ALARM OFF - Indicates that the Alarm Off pushbutton is depressed on SSA, preventing any alarm condition.

SSB ALARM OFF - Indicates that the Alarm Off pushbutton is depressed on SSB, preventing any alarm condition.

ALARM, FIRST ALARM , SECOND ALARM, FLOW, VALVE TAMPER, AUTO DEFEAT, MANUAL ACTUATION KEYSWITCH: - same as for FCPl.

Controls on SSA and SSB

MANUAL ACTUATE keyswitch - by turning this keyswitch and depressing the yellow pushbutton of the appropriate suppression system, a suppression system will be manually actuated. (SSA Only)

AUTO DEFEAT keyswitch - by turning this keyswitch and depressing the yellow pushbutton of the appropriate suppression system, automatic actuation of a suppression system is prevented. (SSA and SSB)

POWER OFF-ON LEDs - indicate availability of normal power source. The OFF LED is amber and the ON LED is green.

ALARM LED - indicates a smoke or heat detector in an area is alarming, or an alarm condition on SSA or SSB. Also sounds the common alarm bell in the Control Room. The ALARM LED is red.

TRBL LED - indicates a trouble condition; this could be a problem with the supervision of a circuit, auto defeat of a suppression system, or a high battery charging rate. This also sounds the EE board sonalert. The TRBL LED is amber.

EARTH LED - indicates a system ground fault. This also sounds the EE board sonalert. The EARTH LED is amber.

BATTERY TRBL or HI-RATE LEDs - TRBL (amber) indicates low or no voltage condition. HI-RATE (amber) indicates the battery is charging at the high rate. Either condition sounds the EE board sonalert. Battery charging rate for SSB is automatically selected.

ALARM ACK pushbutton - silences alarms at the Satellite Station (SSC only).

DRILL pushbutton - not used.

ALARM OFF (Yellow Strip) pushbutton - silences all audible alarm devices; lights TRBL LED when activated.

BATT HI-RATE pushbutton - places battery charger in high rate mode; BATT HI-RATE LED should be lit while this button is activated. The battery charging rate for SSB is automatically controlled.

TRBL OFF (Red Strip) pushbutton - silences system trouble alarms.

RESET pushbutton - restores the system to normal and must be operated after alarm or trouble conditions have been cleared.

CITY OFF pushbutton - not used.

LAMP TEST pushbutton - lights all LEDs except power OFF and ON.

Controls on SSC Operator Interface Module:

Alphanumeric Display - Provides descriptions of all points in alarm, supervisory or trouble condition, and automatically changes as the status of each point changes.

Fire Alarm LED and Fire Alarm Ack key - The Fire Alarm LED flashes to indicate the presence of an unacknowledged alarm condition, along with electronic chime/strobe FKC. The Fire Alarm Ack key silences the audible alarm. The Fire Alarm LED will remain illuminated until the alarm condition clears and the system is reset.

Priority 2 LED and Priority 2 Ack key and indicator - Not used.

Supv LED and Supv Ack key - The Supv LED indicates a supervisory condition such as a valve tamper alarm, along with an audible tone-alert. The Supv Ack switch silences the audible alarm. The Supv LED will automatically extinguish when the supervisory condition clears.

Trouble LED and Trouble Ack key - The Trouble LED indicates a trouble condition such as battery charger trouble, along with an audible tone-alert. The Trouble Ack switch silences the audible alarm. The Trouble LED will automatically extinguish when the trouble condition clears.

Alarm Silence LED and Alarm Silence key - The Alarm Silence key silences audible fire alarms FKC in the Relay Room and FLC in the Control Room. The Alarm Silence LED indicates that this key has been used. A subsequent fire alarm will cause these audible alarms to resound.

System Reset key - System reset is required to reset the system after a fire alarm condition has cleared. It is not necessary to reset the system after a supervisory or trouble condition because the system automatically resets when these conditions clear.

AC Power LED - Indicates the presence of AC power at the panel.

Lamp Test Switch - Illuminates all LEDs on the Operator Interface module.

Entry Keypad, including Enter key, C/Exit key, Menu key, Previous/Next keys, and More Info key - These are used to call up points for monitoring and control.

Enable/Disable keys - These keys allow individual devices such as smoke detectors, or an entire zone of smoke detectors to be disabled or enabled.

On/Arm, Off/Disarm, Auto keys - These keys allow relays or other devices to be forced on or off. The Auto key returns control of the device to the panel.

Event Time key - Displays the time at which an alarm, supervisory or trouble condition occurred.

Clear Peak Values pushbutton - Clears the stored peak values of all smoke detectors on SSC.

<u>Auxiliary Benchboard</u> The Auxiliary Benchboard has the following indications and controls used to augment the Fire Protection System:

Engine Fire Pump Trouble Indicator (EN 16)

Engine Fire Pump Control and Indication

Motor Fire Pump Control and Indication

Motor Fire Pump Breaker Control and Indication

Turbine Building Wall Fan Control and Indication

Turbine Bearing Oil Trip Control

Turbine Bearing Oil Lockout Control

Turbine Bearing Oil Indicator (EN 19)

RIS Temperature Monitor

Fire Service Water Tank Pressure Indicator

Fire Service Water Tank Level Indicator

Booster Pump Discharge Valve Indicators

Booster Pump Control and Indication

Booster Pump Auto Start Indicator (EN 18)

1G Filter Trouble Indicator (EN 35)

Area 2 Trouble Indicator (EN 14)

No. 1 Trans. system Indicator (EN 22)

No. 11 Trans. System Indicator (EN 23)

No. 12A Trans. System Indicator (EN 24)

No. 12B Trans. System Indicator (EN 28)

CREATS Charcoal Filter A&B High Temperature Indicators

The Turbine bearing lockout is a spring-loaded switch that has a tripped and reset position. If the turbine is tripped from the main control board, this switch will swing to the tripped position and will stay there until reset. If this switch is in the tripped position while the Turbine Bearing Oil Trip switch is in the pulled stop position, then the Emergency Bearing Oil Pump and the Turning Gear Oil Pump cannot start or run. The RED light indicates the tripped position.

The Turbine Bearing Oil Trip switch has a normal position and can be put in PULLED STOP position.

The engine fire pump trouble (RED light) located in the upper-middle section indicates the following when lit:

1. Loss control power
2. overcrank
3. overspeed

4. Low oil pressure
5. battery charger trouble
6. High jacket water temp.

The Engine will not trip on any of these signals, except for "overspeed", in which case the trouble light indicates that the overspeed trip has already occurred. The overspeed trip is reset automatically when the engine RPM decreases to less than the set point.

The Diesel Engine Driven Fire Pump start switch has OFF-AUTO and START positions. Turn the switch to the START position, and the pump starts. A RED light will come on to indicate that the pump is running. The BLUE interlock light shows that the Diesel Driven Fire Pump selector switch is in the "OFF", "MANUAL A", or "MANUAL B" position in the screenhouse which means that the diesel will not start on an auto signal.

The manual start push button for the Motor Driven Fire Pump has RED lights which indicate the pump running and/or auto start signal. The red push button is utilized to activate the site audible fire alarm. During use, it should be depressed and held for a minimum of 15 seconds. Below the site fire alarm push button is the digital pressure indicator (PI 2224) indicating pressure on the fire water tank. Normally pressure is maintained at 100 to 115 psig. Directly below the digital pressure indicator is the digital fire service water storage tank level indicator (LI 2012). The normal level of the tank should be 5.75 feet which represents approximately 10,000 gallons of water. The level indicator reads 0-10 feet respectively.

To the far right of the fire service water storage tank level and pressure indicators is the control switch for the turbine building wall fans. When the RED light is lit, the Turbine building wall fans and Feedpump room exhaust fan will operate normally. If it is desired to secure all Turbine building wall fans and Feedpump room exhaust fan to keep from fanning a fire, the switch can be turned to the OFF position and the GREEN light will come on. The Feedpump room exhaust fan breaker located on the reliance control panel must be reset after the main control board switch placed to normal position.

Directly below the Turbine building wall fan control is the RIS temperature monitoring system for the "A" and "B" containment charcoal filters and the containment auxiliary charcoal filters. If a high temperature alarm ($380^0$F) comes in, it will light the ALARM LED associated with the area alarming and will annunciate on the Main Control Board annunciator "K31", "FIRE SYSTEM ALARM PANEL". Pushing the RESET button on the monitor will clear the Main Control Board annunciator and allow another incoming alarm to annunciate. The green push button beside each area can be depressed and the temperature will indicate on the monitor common indicator window. Once the alarm has cleared, the RESET button can be depressed to clear the ALARM LED. The TRIP alarm LEDs and setpoints are not being used at this time.

The Aux benchboard includes indicators that will illuminate if high temperature is sensed in the charcoal filter for the 'A' or 'B' Control Room Emergency Air Treatment System (CREATS). A temperature of $220^0$F sensed at the upstream or downstream sensor for either train will illuminate the indicator for that train and alarm MCB annunciator K-31.

To the immediate left of the RIS containment filter temperature monitoring system is the control and valve position indicator for the fire service water storage tank booster pump. The GREEN light for the booster pump discharge valve indicates that the valve is closed and the RED light indicates that the valve is open. The control switch for the fire service water booster pump is a three position switch (STOP-AUTO-START). The switch should normally be in the AUTO position. When in the AUTO position, the GREEN indicator above the switch should be illuminated and the booster pump will maintain the fire service water storage tank water above 100 psig and at the appropriate level. The STOP/START positions are used to manually fill the Fire Storage Tank. AUTO or MANUAL operation of the pump will be indicated by one of the two RED indicators.

## 10.2.7 Additional Alarms

In addition to the previously mentioned alarms, the following alarms are on Annunciator Panel K:

- Fire Pump Breaker Trip (K-7)
- Fire System Storage Tank Low Pressure (K-15)
- Fire System Storage Tank Low Level (K-23)
- Fire System Alarm Panel (K-31)

## 10.2.8 Water Supplies

The on-site Fire Service Water provides the supply for most of the automatic and manual water suppression systems and hose stations inside the plant. The off-site supply for the fire hydrants (yard hydrants) on the yard fire main are supplied with water from the town of Ontario. The yard hydrant system can be used as a back-up to some of the fixed protection systems and inside hose stations by cross-tying both systems through wall hydrants in four locations. The yard loop system provides fire water for systems S18, S50 and various other non power block buildings.

A dry hydrant drafting assembly was installed just west of the Screenhouse for the purposes of drafting water from the discharge canal. The use of an on-site pumper truck is required to utilize this water supply.

## 10.2.9 Fire Service Water Components

The water supply is delivered by a combination of two vertical shaft centrifugal fire pumps located in the Screen House. Both pumps take suction from the circulating water intake. One pump is diesel engine driven and the other is electric motor driven. When the system pressure drops below 95 psig, the electric motor driven fire pump starts. If the pressure drops below 85 psig, the diesel-driven fire pump starts. Both pumps start automatically on actuation of a suppression system. Both pumps can be started manually from the Auxiliary Benchboard or locally at the controllers in the Screen House. The Diesel-driven fire pump will start on a loss of MCC-1G. The reason is that power is lost to the starting circuitry through Lighting Panel ACPDPSH01.

The electric motor driven fire pump trips automatically on undervoltage and SI or can be manually tripped at the breaker in the Screen House. Pump running and pump power loss or engine trouble signals are annunciated in the Control Room as well as at the individual controllers. The diesel-driven fire pump has no automatic trips. The fuel supply tank for the diesel-driven fire pump is located in the Screen House. It contains an eight hour minimum fuel supply. Each pump has a rated output of 2000 gpm at 125 psig minimum, which is adequate to meet the largest anticipated water demand. Design Analysis DA-ME-2001-031 documents the pump performance capabilities versus the various suppression system demands.

A separate 10" discharge line from each fire pump supplies the 8" and 10" on-site loop main. All automatic and manual fixed water suppression systems and interior hose stations are supplied by this loop main. Gate valves subdivide the loop into a number of sections so that a single section can be isolated without impairing the entire loop. The design is such that isolation of a section of fire water piping system does not cause a loss of both the fixed suppression system protection and the manual hose coverage for the same area with the exception of the Service Building which is provided with two hose reels that are connected to the suppression system piping. Reach & Rod Post Indication Gate Valve sectional valves are provided on the off-site yard main to subdivide it so that a single section can be isolated without impairing the entire system. Electrical supervision is provided for valves controlling water flow into sprinkler or deluge systems. Sectional valves on the on-site loop and valves controlling fire pump discharge are locked open and/or are provided with electrical supervision (valve tamper switches). A 15,000 gallon pressure tank (10,000 gallons of water) with an instrument air system interface and a 120 gpm centrifugal booster pump maintain system pressure at a minimum of 100 psig.

## 10.2.10 Fire Hydrants

Yard hydrants are provided at approximately 250' intervals around the exterior of the plant. The lateral to each hydrant is controlled by a Reach Rod or Post Indicator valve. Firefighting equipment is housed within hose houses. A yard hydrant on the southeast corner of the yard loop provides back-up fire suppression capability for the transformers and primary fire suppression capability for the standby Auxiliary Feedwater Building. A sprinkler system fire department connection is located on the north end of the Service Building and the West side of the Ginna Admin Building and can be supplied by the yard (off-site) system. Also supplied by the off-site system are the Contaminated Storage Building, Warehouse Building, Engineering Building,

Butler Building, Nuclear Assessment Building, Upper Radwaste Storage Building, Ginna Admin Building, Canister Preparation Building and Service Water pump area sprinklers in the Screen House.

An additional dry hydrant barrel assembly is located just west of the Screenhouse for the purpose of drafting with an offsite pumper truck.

### 10.2.11 Hose Stations

Forty-two hose stations are provided to protect various areas of the plant. The nozzles are 1 1/2" fog nozzles pinned to the hose adapters with provision made to prevent use of the straight stream position. The fire hoses furnish a reliable means of obtaining effective fire streams in the shortest possible time if a suppression system is inoperable. The Containment hose stations are supplied through a manually operated ball valve. This valve is normally kept closed. All hose stations are provided with manual shutoff valves. Should any manual hose station be out of service, the location and spacing of other hose stations ensure effective coverage of the affected area after required compensatory measures are implemented. The fire hose shall be UL or ULC qualified. Hose reels are distributed throughout the station so that safety-related areas in the station are within 20 feet of a fog nozzle when attached to not more than 100 foot length of hose.

### 10.2.12 Water Suppression Systems

Water suppression systems include water spray systems and water sprinkler systems with open or closed head nozzles and sprinkler heads. Each spray/sprinkler system has a shutoff valve. All control valves for spray or sprinkler systems are electrically supervised with alarms in the Control Room. Other important valves on the water supply are either electrically supervised or locked in the proper position.

#### 10.2.12.1 *Automatic Water Spray Systems*

Automatic water spray systems (which can also be manually actuated) provide protection for the following:

- Turbine Lube Oil System in the Turbine Building
- Hydrogen Seal Oil System in the Turbine Building
- Oil Storage Room north of the Turbine Building
- Oil-Filled Transformers (1, 11, 12A, 12B) in the Yard outside the Turbine Building
- Cable trays in the Screen House Basement
- Cable Tunnel
- Auxiliary Building Ventilation System Charcoal Filter Unit 1G
- Control Room/Turbine Building Wall
- Air Handling Room Cable trays
- TSC Charcoal Filter Unit

### 10.2.12.2 *Manually Actuated Water Spray Systems*

Manually actuated water systems provide protection for the following:

- Turbine-Driven Auxiliary Feedwater Pump and Oil Tank Area
- Condenser Pit Area
- Relay Room (three separate systems)

The Relay Room water suppression systems serve as a backup to the automatic Halon system which provides primary protection. These three systems essentially provide capability to discharge water to approximately 1/3 of the relay room area each.

### 10.2.12.3 *Automatic Pre-action Sprinkler Systems*

Automatic pre-action sprinkler systems provide protection for the following:

- Auxiliary Building cable entrance area
- Auxiliary Building basement cable tray area (Elevation 235'-8")
- Auxiliary Building cable tray area (Elevation 253'-6")
- Intermediate Building cable tray area
- Both D/G Rooms
- SAFW Building Diesel Generator Area

The sprinkler systems for these areas have closed head (fusible link) sprinklers with pre-action trim on the deluge valves.

### 10.2.12.4 *Automatic Sprinkler Systems*

Automatic sprinkler systems provide protection for the following:

- Service Water Pump Area and Fire Pump Area in the Screen House
- Turbine Island
- Service Building
- TSC Diesel Room
- Auxiliary Building Stairwells and Crane Hatch
- Nuclear Assessment Building
- Engineering Building
- Butler Building
- Simulator Building
- Upper Radwaste Building
- Training Center East
- Turbine Building Intermediate Floor Offices
- Ginna Admin Building
- GE Betz Water Treatment Trailers

- Contaminated Storage Building
- Canister Preparation Building - Dry Pipe
- Material Handling Building
- Firing Range (Dry Pipe)
- Warehouse Annex (Dry Pipe)

## 10.2.13 Gas Suppression Systems and Clean Agent Systems

Total flooding automatic Halon 1301 extinguishing systems are provided in the following:

- Relay Room and MUX Room
- Telephone Service Room in the Turbine building
- TSC SAS/PPCS computer room

These systems are designed to deliver a 5% concentration of Halon in the protected area. A reserve supply of Halon 1301 for the Relay and MUX rooms permits prompt restoration of automatic protection following a system discharge. The manual actuators (one for each system) for the Relay Room and MUX Room are located to the left of the entrance to the Relay Room. Audible alarms and red lights above the entrance door of the appropriate room are activated when either system is actuated. The two manual actuators for the TSC SAS/PPCS computer room are located on the north and south walls of the TSC.

The following are provided with a Clean Agent Suppression System:

- Simulator Room in the Simulator building uses a Sapphire Suppresson System which used 3M Novec 1230 fire protection fluid

- NFPA D/G Enclosure uses a FM-200 suppression system

## 10.2.14 Portable Fire Extinguishers

Pressurized water, dry chemical, and carbon dioxide portable extinguishers are distributed throughout the plant. Portable extinguishers have been selected and installed to meet the type of fire emergency which might occur in the areas where the equipment is located. Their location is made conspicuous by signage and notation of the fire extinguisher station number.

Pressurized water fire extinguishers are best for use on Class A fires and shall not be used on Class B or C fires. Dry chemical fire extinguishers are best for use on Class B fires; however, they may be used on all classes of fires. Two large wheeled ANSUL dry chemical extinguishers are provided for use on turbine bearing oil fires; quick hose connectors are provided on the north side of the generator and turbine. Carbon dioxide extinguishers are best for electrical fires; they are not too effective for Class A fires.

## 10.2.15 Foam Carts

Foam carts are designed to be utilized at any fire hose station for combating class "B" fires. Instructions for use are provided with each foam cart. One cart is located on the turbine operating floor adjacent to the elevator and another is located in the turbine building basement adja-

cent to the elevator.

### 10.2.16 Emergency Lighting

Fixed emergency lighting units are provided in safety-related areas and other areas which contain fire hazards to facilitate emergency operations, manual fire fighting, and access to and egress from each designated fire area. The lighting units are 8-hour rated. In addition to the fixed lighting systems, portable battery powered handlights are provided.

### 10.2.17 Reactor Coolant Pump Oil Collection System

The RCP motor oil collection system consists of a package of splash guards, drip pans, and enclosures assembled as attachments to the reactor coolant pump motor at strategic locations to preclude the possibility of oil making contact with hot reactor coolant system components and piping. Any leaking oil is drained from each individual pump to its own collection tank, which is capable of handling the entire oil inventory of the motor. Strainers are placed at the drain of each drip pan or enclosure. The oil collection components are designed and attached to preclude dislodging during a seismic event.

### 10.2.18 Fire Rated Assemblies

Fire barriers are located throughout the plant to separate established fire areas from each other and also to separate certain safety related areas from the remainder of the plant. These barriers are designed to stop a fire from propagating from one area to the other based upon the fire rating of the barrier. All penetrations in these barriers are sealed with appropriate materials to match the rating requirements of the barrier. Fire areas have been defined based upon separation of equipment and cables to ensure that at least one path of safe shutdown systems is always available.

The fire hazards analysis submitted to the NRC in February 1977 identified the fire barriers in the plant and the requirements for maintaining their integrity. These barrier requirements were determined by the fire loadings calculated for each area subject to a potential fire hazard. As a result of this analysis, several design modifications were implemented at the plant including upgrading of the rating of original barriers and installing new barriers. Additional definition of fire areas and barriers and analysis of fire zones were conducted as part of the 10CFR50, Appendix R, review effort. The addition of the water curtain around the perimeters of the stairwells and equipment hatch at the ceiling level of the Auxiliary building mezzanine floor is a part of this effort. Also, 3 hour rated dampers were installed in ducts penetrating these fire areas. New fire barrier materials were installed in the emergency diesel generator cable vault, battery room 1B, the charging pump room, the Auxiliary building, the Intermediate building, and the Containment.

### 10.2.19 Raceway Protection

Flamemastic, a fire-retardant coating, has been applied in locations containing concentrations of cable trays such as in the vault below emergency diesel generator 1B and at the entrances of the cable tunnel from the Intermediate building, Air handling room, and Auxiliary building. New cables which meet IEEE-383 have also been added in various locations. These cables do not need to be coated with Flamemastic.

In addition, automatic pre-action sprinklers or automatic water spray nozzles are installed for all cable trays where large concentrations of cable trays exist as noted in Section 10.2.12.

In addition, Hemyc wrap has been provided to protect selected raceways to meet separation requirements of the former 10CFR50, Appendix R requirements. The existing installed Hemyc wrap is being maintained where practical, to provide defense-in-depth. Hemyc wrap (HWCB03) located in Battery Room B is the only credited Hemyc wrap under the current license 10CFR50.48(c) (NFPA 805). CS-195 board manufactured by 3M has been used in the diesel generator 1B vault to protect the metal enclosure installed around the power and control

feeds for EDG 1A. This barrier wall was upgraded under PCR 2002-0018 which replaced the wall with a 3-hour rated clay fire brick masonry wall and damper.

## 10.2.20 Structural Steel Protection

Fire protective coatings have been applied to the structural steel members forming or supporting a designated fire barrier. In this regard, the structural steel roof beams and a column that supports the roof of the A and B battery room and the floor of the relay room are provided with a fire protective coating, ALBi-clad, which will ensure that adequate margins of safety will be maintained for at least 1 hour during a fire emergency. Pyrocrete fire proofing materials have been installed in various other plant areas that were identified to require upgrade under EWR 4941.

## 10.2.21 Fire Doors

Fire door assemblies (doors, frames, and hardware) are generally provided in door openings in required fire barriers. These assemblies are UL listed as either 3-hour rated ("A" label), 1 1/2 hour rated ("B" label) or 3/4 hour rated ("C" label). Three hour rated doors are provided in three hour or less rated fire barriers, 1 1/2 hour rated doors are provided in barriers that require a 2 hour or less fire rating, and 3/4 hour rated doors are provided in certain barriers for property conservation purposes.

In some cases, non-rated doors have been used. These doors have been evaluated by a Fire Protection Engineer for their ability to prevent the propagation of a fire. These evaluations are kept on file for review and are documented in Appendix E (Summary of Fire Protection Engineering Evaluations) of the FPPR.

## 10.2.22 Fire Dampers

Fire dampers are generally provided in HVAC ducts that penetrate required fire barriers to prevent the propagation of a fire through the duct. Some duct penetrations do not have fire rated dampers and have been evaluated in appropriate engineering evaluations documented in Appendix E (Summary of Fire Protection Engineering Evaluations) of the FPPR.

In some cases, a smoke damper is also used to isolate an area prior to Halon discharge. Fire dampers are provided with appropriately rated fusible links based on the ambient temperatures in the location. Some dampers are also supplied with electro-thermo links (ETL) that are electrically activated in response to a signal from the fire detection system. The smoke dampers provided with Halon suppression system isolation capability are actuated by Halon system pressure activated release mechanism and/or by thermal link and/or an equivalent method.

## 10.2.23 Penetration Seals

Fire barriers are located throughout the plant to separate major areas from each other and also to

separate certain safety related areas from the remainder of the plant. These are designed to stop a fire from propagating from one area to another based upon the rating of the barrier wall. All penetrations in these barriers are sealed with appropriate materials to match the hourly rating requirements of the barrier.

Visual inspection of fire barrier penetration seals are regularly performed to insure that the penetration seals will continue to perform their design function. There are no rated fire barriers that

perform a pressure sealing function.

## 10.2.24 Floor Drains and Curbs

Safety related equipment is mounted on pedestals and floor drains provided in these areas are generally adequate to carry off fire water and prevent safety-related equipment from being flooded with standing water. In areas such as the control room, where floor drains are not provided, fire water will be drained out through door openings.

Curbs are provided in the screen house to prevent water or flammable liquid from flowing into the basement where both divisions of safety related cables are routed. Additional curbs are provided around the diesel-driven fire pump area in the screen house.

A barrier has been installed around the turbine lube-oil reservoir area to contain possible oil spillage. The capacity of the enclosed area is large enough to retain the entire contents of the lube-oil system plus 10% margin for fire water. The hydrogen seal oil unit is provided with similar capability.

Where drains from safety-related areas are tied into drains from areas which contain a large quantity of flammable liquid, backflow protection is provided to prevent possible spread of a liquid fire via the drain system. (Refer to EWR 2720)

## 10.2.25 Communications

There are three communication systems within the plant. The primary system is the combination paging and party system; in addition, there is a sound powered phone system and a radio paging system.

The sound powered system is hard wired with separate wires from the combination paging and party system. The radio paging system provides communication with areas inside the containment with the help of a radio antenna mounted in the containment. Additionally, a repeater located in the Nuclear Assessment Building and remote amplifiers and a distributed antenna system installed in the plant allows for greater flexibility with radio communications. There is adequate redundancy with these three systems to ensure good communications throughout the plant during any fire emergency.

## 10.2.26 Wet Chemical Suppression

A Wet Chemical Suppession System is installed in the service building cafeteria food preparation area. This is an automatic and manual system which, upon activation, de-energizes the local cooking equipment, automatically isolates the gas to the cooking appliances, and activates the kitchen hood ventilation. Horn and strobes will activate in the Ginna Admin Building upon system activation, in addition to an alarm on the Guard House Fire Alarm Panel.

### 10.2.27 Clean Agent Suppression (NOVEC 1230)

A Clean Agent Suppression System is installed in the Document Storage Vault constructed in the Ginna Administrative Building. This automatic and manually operated system will signal the Administrative Building and guard house alarm panels when activated. The system, upon fire signal, will shutdown the local HVAC unit supplying the vault and will automatically close the smoke dampers installed in the supply and return ducts. This system is a non-toxic and 100% non-conductive agent safe for use on all media types.

## 11.0 Suppression Effects Evaluation

Water spray shields are provided in the Intermediate Building over the control rod drive motor control center and switch-gear, and in the Screenhouse and Auxiliary Building over switchgear, motor control centers, and other electrical equipment to help protect this equipment from damage or undesirable effects from the application of fire water. CAR 1869 evaluated the effects of inadvertent suppression system actuation and found the consequences acceptable except for some minor issue that were resolved by modifications. EWR 1833 installed additional features to control water from the suppression systems.

An evaluation was performed within 51-9183281-00A, "R.E. Ginna NFPA 805 Fire Suppression Effects Analysis (reference 4.2.27)"; to demonstrate that Ginna's fire suppression activities will not negatively impact the ability to achieve the nuclear safety performance criteria within NFPA 805, 2001 edition. This evaluation included the review of automatic or manual activation of plant fixed fire suppression systems which include water based Halon 1301 systems as well as potential water migration from manual firefighting activities.

It was determined that, with the exception of the Relay Room (RR), the results validate that the fire suppression activities will not have an impact on achieving the nuclear safety performance criteria. Fire Response Procedure FRP-19.0 was revised to include a note to warn the fire brigade that specific fire systems may activate should SSA be wetted by actuation of the deluge system.

## 12.0 Fire Protection System Impairments and Compensatory Actions

The Technical Requirements Manual (TRM) (Ref. 4.2.10) list the operability requirements for the fire protection systems, required actions to be taken when equipment is inoperable, and surveillance requirements. These requirements were previously located in the Technical Specifications, but were removed in accordance with Generic Letter 86-10, "Implementation of Fire Protection Requirements," (Ref. 4.1.9) and Generic Letter 88-12, "Removal of Fire Protection Requirements From Technical Specifications," (Ref. 4.1.11) and located within the UFSAR (Ref. 4.2.2). The operability and surveillance requirements were subsequently relocated to the TRM (Ref. 4.2.10).

Fire suppression systems should be restored to standby status as soon as possible following a fire. The activated system will be reset and checked in accordance with the system manufacturer's instructions. This will include (as appropriate) draining the system, inspecting for fire damage, cleaning system components, replacing sprinklers, adding valve priming water, restoring air pressure to dry pilot lines, restoring water to the system, resetting dampers and replacing fusible links in ventilation systems, recharging Halon tanks, resetting/replacing detectors, and resetting alarms.

Fire detection and suppression system operability requirements, remedial actions, and surveillance requirements are described in the Technical Requirements Manual (TRM) (Ref. 4.2.10).

Guidance for control of inoperable fire detection and suppression systems/components and inoperable fire barriers and associated remedial actions area detailed in procedure A-52.12, "Inoperability of Equipment Important to Safety" (Ref. 4.2.12.2).

Fire Protection compensatory actions for impairments or challenges to the SSEL (Safe Shutdown Equipment List) or requirements, are detailed in procedure A-601.13 (reference 4.2.1).

Fire Protection compensatory actions for impairments or challenges to non-power operations SSCs (Structures, Systems, and Components), are detailed in procedure IP-OUT-2 (reference 4.2.12.34).

# PART III FIRE HAZARDS ANALYSIS

## 1.0 Introduction

Part III of the Fire Protection Program Report (FPPR) documents the results of the fire hazards analyses performed for fire areas/fire zones at Ginna Station. The results are documented on a fire area/fire zone basis, and include identification of the following for each fire area/fire zone:

1. Major safe shutdown related and non-safe shutdown related equipment;
2. Fire protection features provided including suppression systems, detection systems, and the presence of hose stations and portable fire extinguishers;
3. Fire barrier design features including materials of construction, fire doors and fire dampers;
4. Special provisions in the fire area/zone including the presence of cable wrap;
5. Combustible loading, fire severity classification, and identification of major combustibles;
6. Potential hazards;
7. NRC approvals from the requirements of NFPA 805 Chapter 3 and;
8. Listings of engineering evaluations of fire protection features which are summarized in Appendix E of the FPPR.

## 2.0 Definitions

Refer to Part II - Fire Protection Plan, Section 5 for a complete list of definitions applicable to fire protection at Ginna Station.

# 3.0 References

| | |
|---|---|
| **3.1** | 1977 Fire Protection Evaluation. |
| **3.2** | DA-ME-94-017, Appendix R Fire Barrier Ratings. |
| **3.3** | Update of R.E. Ginna Nuclear Station Fire Protection Evaluation, Report No. 02-0950-1340, Volumes I & II, Impell Corp. |
| **3.4** | DA-ME-98-004, Combustible Loading Analysis, current revision |
| **3.5** | Ginna Station Fire Door Manual. |
| **3.6** | Ginna Station Fire Damper Manual. |
| **3.7** | Fire Barrier General Arrangement Sheets, 21488-100 Sheets 1-6. |
| **3.8** | Fire Response Plans, 33013-2540 through 33013-2581. |
| **3.9** | National Fire Protection Association's Fire Protection Handbook, 17th edition. |
| **3.10** | Appendix R Alternative Shutdown System, Revision 7. |
| **3.11** | DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99 |
| **3.12** | 51-9089546-001, Ginna NFPA 805 Nuclear Safety Capability Assessment. This reference is "historic". It was superseded by 0028-0011-007-001. |
| **3.13** | 32-9183379-001, R.E. Ginna NFPA 805 Coordination Study. This reference is "historic". It was used as an input to the NSCA. It is classified "historic" since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well. |
| **3.14** | HAI-0028-0011-002-003, R.E. Ginna Nuclear Power Station NFPA 805 Fire Risk Evaluations. This reference is "historic". It was developed as part of the NFPA 805 project and was used as an input to determine what recovery actions and modifications were required to achieve and safe and stable hot shutdown condition. It is classified "historic" since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well. |
| **3.15** | 51-9183281-00A, R.E. Ginna NFPA 805 Fire Suppression Effects Analysis. |

**3.16** 0028-0011-008-001, R.E. Ginna Non-Power Operations Upgrade. This reference is "historic". It is classified "historic" since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

**3.17** 51-9140371-000, R.E. Ginna Nuclear Power Station – NFPA 805 Transition – Non-Power Component Selection. This reference is "historic". It was used as design input to the historical Non-Power Operations Pinch Point Analysis 51-9177694-000. Similarly, to the NSCA, this reference represents the plant as it was a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

**3.18** Genesis Solution Suite software for cable tracking

**3.19** 0028-0011-007-001, Ginna NFPA 805 Nuclear Safety Capability Assessment. This reference is "historic". It was developed as an input to the NFPA 805 transition to ultimately determine what recovery actions and modifications were required to achieve and safe and stable hot shutdown condition. It is classified "historic" since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

**Note:** Additional references are listed in Part II - Fire Protection Plan, Section 4, and Appendix E - Summary of Engineering Evaluations.

# 4.0 Assumptions

**4.1** Each fire barrier and its location must meet or exceed the rating that it was intended for. If a barrier is unable to meet the criteria, then the basis for acceptance is required to be justified, through engineering evaluation and/or by analyzing why the rating is not required i.e., absence of significant fire hazards, presence of suppression systems, detection systems and/or low combustible loading.

**4.2** An 8" thick hollow concrete block wall barrier is capable of a two (2) hour rating based upon UL directory listings of similar materials and design analysis DA-ME-94-118-01 which documents the capabilities of this type of barrier wall.

**4.3** A 12" thick hollow concrete block wall barrier is capable of a three (3) hour rating based upon UL directory listings of similar materials. Since poured concrete walls are also utilized at Ginna in wall depths exceeding 12", they are also considered to be three (3) hour rated. Design analysis DA-ME-94-118-01 also addresses the suitability of three (3) hour rated masonry material barriers.

**4.4** Floor barriers which are constructed of poured concrete in depths exceeding 4 1/2" are capable of two (2) hour rating based upon analysis which was completed under DA-ME-94-118-01. Floor barriers with depths exceeding 6" are capable of three (3) hour rating based upon analysis which was completed under DA-ME-94-118-01.

# 5.0 Background

The following sections document the background of the development of the fire hazards analysis for Ginna Station. The initial 1977 Fire Protection Evaluation is discussed followed by subsequent evaluations and analyses.

# 5.1 1977 Fire Protection Evaluation

On May 11 and September 28, 1976, the NRC requested a comparison between Ginna's fire protection program and Branch Technical Position (BTP) APCSB 9.5-1 for Ginna Station. On February 24, 1977, Ginna responded to this request with the Fire Protection Evaluation for Ginna Station (Ref. 3.1). The report consisted of the following:

1. A comparison of the existing fire protection program provisions with the guidelines of Appendix A to BTP APCSB 9.5-1;
2. A fire hazards analysis of all identified fire areas; and,
3. A safe shutdown analysis to evaluate the capability of Ginna to be safely shutdown in the event of a fire.

In this report, Ginna divided the plant into major fire areas, with each building designated as a separate fire area. The only exception to this procedure was the Diesel Generator Building, which was designated as two fire areas because of the three-hour barrier separating the diesel generators. Fifteen fire areas were identified in the report. In addition, four of the designated fire areas were further subdivided into fire zones.

## 5.2 Post - 1977 Fire Protection Evaluation

After the completion of the 1977 analysis, additional fire zones were designated in the plant. A second level was added to the Condensate Demineralizer Building and was designated the Technical Support Center. In the Reactor Containment and Auxiliary Buildings, additional fire zones were created to simplify data collection. For the Reactor Containment and Auxiliary Buildings, the zone boundaries are basically artificial in nature, with floor/ceiling assemblies and column lines utilized in the Auxiliary Building. This resulted in a total of 62 fire zones identified in the 1977 analysis.

## 5.3 1983 Appendix R Evaluation

Following issuance of Appendix R, a Ginna review of system separation at Ginna Station plus the prospect of integration with other potential regulatory requirements resulted in a preliminary decision to implement a dedicated shutdown system to achieve compliance with Appendix R. As a result of a review of the various alternatives available to achieve compliance, including the exemption process and the relative cost-effectiveness of each alternative, Ginna reevaluated the methods by which safe shutdown could be achieved. Revised safe shutdown methods were developed, and fire areas were redefined based on separation of equipment and cables to ensure that at least one path of safe shutdown systems is always available.

A fire area in this report was defined as that portion of a plant separated from other areas by boundary fire barriers. The required rating of the barriers was determined by the fire hazard within each area. At Ginna Station, the construction of walls, floors, and ceilings is typically either of reinforced concrete construction having a fire rating in excess of three hours or of concrete block construction with a fire rating of at least two hours. Based on this criteria, 17 fire areas were identified at Ginna.

The only exceptions to two or three-hour-rated boundary fire barriers occurred in three locations: at the 289 ft 6 in. elevation of the Control Building (Control Room), at the access points into the Cable Tunnel, and at the floor-to-floor interface of the fire areas in the Auxiliary Building. Each is discussed separately below.

The Control Building is separated from the Turbine Building by a two-hour-rated wall, except at elevation 289 ft 6 in. At this elevation, the original metal and glass partition is maintained between the Control Room and Turbine Building. On the Turbine Building side of the glass partition, a pressure/security wall was added, with a dead-air space between the two. In addition, a water curtain was provided on the Turbine Building side of the pressure/security wall for fire protection purposes. This combination of passive and active fire protection is justification for considering this wall as a fire area boundary.

Access to the Cable Tunnel is provided at three locations: the Auxiliary Building, the Control Building, and the Intermediate Building, all at elevation 253 ft. At the Auxiliary Building, an access door which was sealed closed in a fire wall provides access to the Cable Tunnel. However, due to the quantity of cable trays and conduits penetrating the wall, the integrity of the three-hour barrier cannot be verified and the boundary has been downgraded to a smoke partition. In the Air Handling Room of the Control Building, the barrier interface with the Cable Tunnel is also a fire wall; however, due to the quantity of cable tray penetrations, this barrier is also considered a smoke barrier only. Most cables, except some newer cables rated to IEEE-

383 criteria, penetrating into the Cable Tunnel from the Auxiliary, Intermediate, and Control Buildings, have been coated with Flamemastic for a distance of six feet on both sides of the boundary. The barriers through which the cable trays penetrate are made up of three layers of sheet metal with ceramic fiber sandwiched in between and the tray penetrations are sealed with foamed-in-place silicone rubber. At the Intermediate Building interface with the Cable Tunnel, there is a vestibule constructed of materials capable of providing a one-hour fire rating. The vestibule is considered as the main point of access into the Cable Tunnel. Again, due to numerous cable tray and conduit penetrations and because this configuration has not been tested, this vestibule is considered to be a smoke enclosure only. Automatic suppression and detection are provided in the Cable Tunnel and over the cables and conduits on the Intermediate, Auxiliary, and Control Building sides of the boundary. This protection permits the Cable Tunnel to be treated as a separate fire area. Refer to DA-ME-118-4, -5 and -6.

Two open stairways and a potentially open hatch approximately 120 $ft^2$ in area connect the three levels of the Auxiliary Building. Close-spaced, closed-head sprinklers are provided around the stair and hatch openings at the ceiling of elevation 253 ft to form a barrier against the passage of products of combustion to the area above. These sprinkler heads are provided with shields to prevent cooling of the fusible link by spray from an adjacent head. Heavy construction removable floor blocks are usually installed in the hatch area at the ABO level. In Part IV Safe Shutdown Analysis, Section 9, the bases for requesting and approving an exemption from protecting the gap around the refueling water storage tank are presented. Since the approval of the exemption, a steel plate has been installed to seal the gap around the RWST. Based on the existing protection at the ceiling of elevation 253 ft of the Auxiliary Building, the operating (top) level may be treated as part of a fire area separate from the fire area made up of the two levels below.

Other penetrations and openings in barriers separating fire areas which contain safety-related equipment are sealed to provide a level of protection commensurate with the fire hazard in the area.

## 5.4 Transition to NFPA 805

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 Risk-Informed, Performance-Based (RI-PB) fire protection requirements. 10 CFR 50.48 (c) incorporates by reference, with exceptions, 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). On December 19, 2005 Constellation Energy Nuclear Generation, LLC (CENG) submitted a Letter of Intent (LOI) to the NRC to adopt NFPA 805-2001 for R.E. Ginna Nuclear Power Plant (REG).

NEI developed NEI 04-02 to assist licenses in adopting NFPA 805 and making the transition from their current fire protection licensing basis to one based on NFPA 805. The NRC issued Regulatory Guide 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.

On March 28, 2013, Ginna submitted to the NRC a License Amendment Request Pursuant to 10 CFR 50.90: Adoption of NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition). This amendment request also follow the guidance in NEI 04-02, "Guidance for Implement a Risk-Informed, Performance-Based Fire Protection Program under 10 CFR 50.48 (c)," Revision 2.

The Safety Evaluation for the NFPA 805 License Amendment Request was issued to Ginna on November 23, 2015 (ML15271A101).

Subsequently, on June 30, 2017, a license amendment request associated with the implementation of NFPA 805, 2001 edition, was submitted to the NRC. The Safety Evaluation for this change was issued to Ginna on June 25, 2018 (ML18114A025) with identified correction dated July 12, 2018 (ML18190A472).

## 5.5 Combustible Loading Analysis

An update to the 1986 combustible loading analysis was prepared (Ref. 3.4). This update used the 1986 update to the combustible loading (Ref. 3.3) as the basis. The impact to combustible loading of plant modifications that had been performed since the 1986 update to the combustible loading calculation was also included in the update. In addition, a database was utilized to track the amounts of combustibles located in each fire area/fire zone. Summaries of the combustible loading values are included in the fire area/fire zone analyses in Section 7.

Subsequent revisions to the combustible loading analysis have been made to incorporate modifications that have been performed since the issuance of Revision 0. In addition, the impact of the changes to the combustible loading on exemptions from specific fire areas/zones are also evaluated within the analysis.

## 5.6 Fire Hazards Analysis

The fire hazards analysis is based on the original fire hazards analysis pre- pared in 1977 (Ref. 3.1) and updated in 1986 (Ref. 3.3). During the 1986 update, the division of the plant into fire areas and fire zones was re-evaluated and the term sub-zone, previously used in prior documentation, was removed. The sub-zones were combined with other zones to form logical groupings of rooms. During the 1998 and 2000 updates, five previously existing fire areas (AVT, H2, SB, TB, TO) were combined to form a Balance of Plant (BOP) fire area. The justification for the reconfiguration of these fire areas is documented in DA-ME-98-083 (Ref. 3.11). Additional fire areas/zones were added for Fire PRA purposes only as noted in Table 6-1. This resulted in the fire areas/zones listed in Table 6-1.

During the 2000 update, the MUX Room (CC/RRM) and Relay Room Annex (CC/RRA) were combined with the Relay Room fire zone (CC/RR). (Refer to DA-ME-2000-064.) This

resulted in the updated fire area/zone listed in Table 6-1. For the unified zone, area configuration, combustible loading changes, and fire protection and safe shutdown features were updated throughout the Ginna Station Fire Hazards Analysis and Combustible Loading Analysis.

## 5.7 Updated Fire Hazards Analysis

During the transition to NFPA 805, the fire area assessments were completed as part of the Nuclear Safety Capability Assessment (NSCA) (reference 3.12). The cable tracking software contains the updated safe shutdown equipment (SSE) list. The Fire Hazard Analysis was updated, as shown in section 7.0, to identify the safe shutdown equipment associated with each fire area/zone, additional fire zones in fire area RC to reflect the fire PRA, deletion of the exemption section since NFPA 805 license did not carry the exemptions forward, inclusion of NRC approvals for specific NFPA 805 Chapter 3 requirements, updated engineering evaluations, and identification of any non-power ops (NPO) pinch point areas as discussed below.

The transition to NFPA 805 required that the licensee perform an engineering analysis to assess the impact of fires occurring in all operational modes, including Non-Power Operations (NPO). This was performed per reference 3.16 and 3.17. The purpose of these analyses is to provide reasonable assurance that nuclear fuel will remain in a safe and stable condition during NPO to meet the nuclear safety goals of NFPA 805. The results of the NPO analysis identified specific fire zones, that may result in a total loss of a (KSF) key safety function (i.e., Decay Heat Removal, Inventory Control, Power Availability, Reactivity Control, and Support Systems), with a postulated fire. A complete loss of a KSF, is called a "Pinch Point". The Fire Hazard Analysis was also updated, as shown in section 7.0, to identify fire zones with NPO pinch points.

Additional fire protection/fire prevention actions to manage fire risk during High Risk Evolutions (HREs) within fire zones with a pinch point is administratively controlled within IP-OUT-2. As defined in IP-OUT-2, HREs are:

"Outage activities, plant configurations, or conditions during shutdown where the plant is more susceptible to an event causing the loss (KSF=RED) of a Key Safety Function".

# 6.0 Identification of Fire Areas

Table 6-1 summarizes the fire areas and fire zones that are used at Ginna Station. The fire areas and fire zones that appear in Table 6-1 are the result of the reconfiguration that was performed during the preparation of the Fire Protection Program Report.

The fire areas listed in Table 6-1 also correspond to the fire areas used in Part IV - Safe Shutdown Analysis. The analyses that appear in Section 7 are based on the fire areas listed in Table 6-1. In the event that a fire area contains individual fire zones, the fire hazards analysis for the fire area is performed on a fire zone by fire zone basis. Some fire areas/zones were added to Table 6-1 for Fire PRA purposes only and are not included within the discussions in Part IV or in Section 7.

## 6.1 Plant Layout

The layout of the plant is depicted on Figures 9-1 through 9-6 of this FPPR report section. Additional information regarding plant layout can be found on the Fire Barrier General Arrangement Drawings (Ref. 3.7) and the Fire Response Plans (Ref. 3.8).

## 6.2 Analysis Methodology

The following information on fire protection features is presented for each fire area/fire zone:

1. Fire Area Identification including name and elevation.
2. The presence of Safe Shutdown equipment in the fire area/fire zone is indicated.
3. Major Safe shutdown equipment and major non-safe shutdown related equipment in the fire area/fire zone is identified.
4. Identification of NPO pinch point area.
5. Fire protection features including suppression systems, portable fire extinguishers, hose stations, and detection systems in the fire area/fire zone are identified.
6. Design features including boundary construction, fire doors, fire dampers and special provisions (e.g., fire wrap) are identified for each fire area/fire zone.
7. Combustible loading for the fire area/fire zone is identified based on the Combustible Loading Analysis (Ref. 3.4). This includes the floor area of the fire area/fire zone, equivalent fire severity classification and major combustibles in the fire area/fire zone. The following Fire Severity Index is used to qualify the hazards associated with the combustible loading and was developed using the Fire Protection Handbook (Ref. 3.9):

| FIRE SEVERITY INDEX | COMBUSTIBLE LOADING CLASSIFICATION |
|---|---|
| Low | 0 to less than 60,000 BTU/ft$^2$ |
| Medium | 60,000 BTU/ft$^2$ to less than 120,000 BTU/ft$^2$ |
| High | 120,000 BTU/ft$^2$ and greater |

8. Potential hazards that are located within the fire area/fire zone are identified.
9. NRC Approvals from NFPA 805 Chapter 3 Requirements.
10. Engineering evaluations (86-l0) that have been prepared to document and justify existing fire protection configurations in the plant are summarized. A complete listing of fire protection related engineering evaluations are presented in Appendix E of the FPPR.

## Table 6-1
## FIRE AREAS/FIRE ZONES

| Fire Areas/Zones | Description |
|---|---|
| ABBM<br>Zone ABB<br>Zone ABM | Auxiliary Building Basement/Mezzanine<br>Auxiliary Building Basement Floor, Elevation 235'-8"<br>Auxiliary Building Mezzanine Floor, Elevation 253'-0" |
| ABI<br>Zone ABO<br>Zone IB-0<br>Zone IBN-1<br>Zone IBN-2<br>Zone IBN-3<br>Zone IBN-4<br>Zone IBS-1<br>Zone IBS-2<br>Zone IBS-3<br>Zone N2<br>Zone CPB | Auxiliary Building/Intermediate Building<br>Auxiliary Building Operating Floor<br>Intermediate Building Sub-Basement, Elevations 237'-0" & 238'-0"<br>Intermediate Building North, Elevation 253'-6"<br>Intermediate Building North, Elevation 278'-4"<br>Intermediate Building North, Elevation 298'-4"<br>Intermediate Building North, Elevation 315'-4"<br>Intermediate Building South, Elevation 253'-6"<br>Intermediate Building South, Elevation 271'-0"<br>Intermediate Building South, Elevation 293'-0"<br>Nitrogen Storage Building, Elevation 271'-0"<br>Canister Preparation Building, Elevation 269'-2" |
| BOP<br><br><br><br>Zone AVT<br>Zone H2<br>Zone SB-1<br>Zone SB-1HS<br>Zone SB-1WT<br>Zone SB-2<br><br>Zone TB-1<br>Zone TB-1FP<br>Zone TB-2<br>Zone TB-3<br>Zone TO<br>Zone TSC-1M<br><br>Zone TSC-1N<br>Zone TSC-1S<br><br><br>Zone GAB | Balance of Plant (including the Condensate Demineralizer Building, Technical Support Center, Hydrogen Storage Building, Service Building, Turbine Building, Turbine Oil Storage Building and Ginna Admin Building)<br><br>Condensate Demineralizer Building, Elevation 253'-6"<br>Hydrogen Storage Building, Elevation 253'-6"<br>Basement, Elevation 253'-6"<br>Hot Shop, Elevation 253'-6"<br>Water Treatment Room, Elevations 253'-6" & 271'-0"<br>Office Level, Elevation 271'-0"<br>(Excludes area above SB-1WT)<br>Basement, Elevation 253'-6" & DI Trucks<br>Feedpump Room, Elevation 253'-6"<br>Intermediate Floor, Elevation 271'-0"<br>Operating Floor, Elevation 289'-6"<br>Turbine Oil Storage Building, Elevation 253'-6"<br>Technical Support Center, Elevation 271'-0"<br>(Mechanical Equipment Room and Administrative Computer)<br>Technical Support Center, Elevation 271'-0"<br>Technical Support Center, Elevation 271'-0"<br>(South of Corridor) which includes the TSC diesel generator room, TSC inverter room, and TSC battery room<br>Ginna Administrative Building - All Levels |

| Fire Areas/Zones | Description |
|---|---|
| BR1A | Battery Room 1A, Elevation 253'-6" |
| BR1B | Battery Room 1B, Elevation 253'-6" |
| CC<br>Zone AHR<br>Zone RR<br><br>Zone CR | Control Building Complex<br>Air Handling Room, Elevation 253'-6"<br>Relay Room, Elevation 271'-0"<br>(includes MUX and Annex rooms)<br>Control Room, Elevation 289'-6" |
| CHG | Charging Pump Room, Elevation 235'-8" |
| CT | Cable Tunnel, Elevation 260'-6" |
| EDG1A | Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253'-6" |
| EDG1B | Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253'-6" |
| RC<br>Zone RC-1<br>Zone RC-2<br>Zone RC-3<br><br>Zone T-LOOPA<br>Zone T-LOOPB<br>Zone T-Reactor<br>Zone T-PRZR | Reactor Containment Building<br>Reactor Containment Building Basement Floor, Elevation 235'-8"<br>Reactor Containment Building Intermediate Floor, Elevation 253'-3"<br>Reactor Containment Building Intermediate Floor, Elevations 274'-6" & 278'-4"<br>Reactor Containment "A" Loop<br>Reactor Containment "B" Loop<br>Reactor Containment Cavity Area<br>Reactor Containment Pressurizer |
| SAF | Standby Auxiliary Feedwater Pump Building, Elevation 271'-0" |
| SH<br>Zone SH-1<br>Zone SH-2<br>Zone SH-3 | Screen House Building<br>Basement, Elevations 239'-6" & 243'-6"<br>Operating Floor, Elevation 253'-6"<br>Circulating Water Pump Area, Elevation 237'-0" |
| WS | Contaminated Storage Building, Elevation 271'-0" |
| YARD | Transformer Yard General Area |
| INTAKE | Included for Fire PRA purposes only. Shown on 33013-2928,21 |
| OFFSITE | Included for Fire PRA purposes only. Shown on 33013-2928,21 |
| ONSITE | Included for Fire PRA purposes only. Shown on 33013-2928,21 |
| PA<br>Zone PA-NE<br>Zone PA-NW<br>Zone PA-SE<br>Zone PA-SW | Protected Area<br>Included for Fire PRA purposes only. Shown on 33013-2928,21<br>Included for Fire PRA purposes only. Shown on 33013-2928,21<br>Included for Fire PRA purposes only. Shown on 33013-2928,21<br>Included for Fire PRA purposes only. Shown on 33013-2928,21 |

# 7.0 Fire Area/Fire Zone Analysis

The following sections represent the fire hazards analyses that have been performed for the fire areas and fire zones at Ginna Station. The analyses sections are presented by fire area and subsequently by fire zones within the fire area as applicable.

# 7.1 Fire Area ABBM

Fire Area ABBM consists of two fire zones in the Auxiliary Building:

| | |
|---|---|
| Zone ABB | Auxiliary Building Basement Floor, Elevation 235'-8" |
| Zone ABM | Auxiliary Building Mezzanine Floor, Elevation 253'-0" |

Fire zone ABB consists of the Auxiliary Building basement floor on elevation 235'-8". The fire zone also includes the RHR pump pit located on elevation 219'-0". The fire zone contains equipment used for safe shutdown which includes RHR Pumps A and B, RHR Heat Exchangers A and B, and SI Pump B. Non-safe shutdown equipment located in the fire zone includes SI Pumps A and C, Containment Spray Pumps A and B, Spent Fuel Pumps A and B, and Reactor Coolant Drain Tank Pumps A and B.

Fire zone ABM consists of the Auxiliary Building Mezzanine floor on elevation 253'-0". The fire zone contains safe shutdown related equipment which includes Bus 16, Auxiliary Building DC Distribution Panel B1, MCCs D and M and RHR Heat Exchangers A and B. Non-Safe Shutdown related equipment includes Waste Gas Compressors A and B.

In addition, the Refueling Water Storage Tank (RWST) is located in both of these fire zones. The RWST pene- trates the ceiling in fire zone ABM. However, the gap has been sealed with a steel plate. Refer to DA-ME-95-154. Suppression systems have been provided at the east and west stairs and the crane hatch to prevent fire spread to the Auxiliary Building Operating Floor and at selected hazards in the fire zones.

## Auxiliary Building Basement Floor

**Fire Area ABBM**

**Fire Zone ABB**

**Elevation 235'-8"**

**Safe Shutdown Equipment (SSE) in fire zone?** Yes

**Major SSE in fire zone** (Reference 3.18)

Containment spray (CS) pump A/B (PSI02A/PSI02B), CS discharge MOVs (860A/860B/860C/860D), VCT outlet AOV (112C), charging flow control valve (142), RCS letdown isolation valve (371), RHR pump A/B (PAC01A/PAC01B), 850A/B, 856, Spent Fuel Pump Recirc Pump B (PAC07B), Safety Injection Pump (SI) A/B/C (PSI01A/B/C) and the RWST tank (TSI01).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Spent Fuel Pump Recirc Pump A, Reactor Coolant Drain Tank Pumps A and B, and SI Fill Pump.

### Fire Protection

Suppression System(s)

- S01 is an automatic pre-action suppression system for the Auxiliary Building basement central section.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.

Detection System(s)

- S01 smoke detectors actuate suppression system S01.
- Z01 smoke detectors provide detection for the Auxiliary building east section including the Charging Pump Room
- Z02 smoke detectors provided detection for the Auxiliary building west section including the Auxiliary Building sub-basement (RHR Pit)
- Pyrotronics area 1 zone 1 provide detection in the ventilation system in the area of the waste evaporator panel area
- Pyrotronics area 1 zone 2 provide detection in the ventilation system for the general east area and the Charging Pump Room

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated poured concrete barrier to Fire Area ABBM/Fire Zone ABM |
| Floor: | Non-rated reinforced concrete to grade. |
| North Boundary: | Non-rated reinforced concrete to grade.<br>3 hour rated 12" thick hollow concrete block to Charging Pump Room (Fire Area CHG) Poured concrete greater than 3 hours to Containment (Fire Area RC/Fire Zone RC-1)<br>3 hours to Seal Filter Room (Fire Area CHG) |
| South Boundary: | Non-rated reinforced concrete to grade. |
| East Boundary: | 3 hour rated 12" thick hollow concrete block to Charging Pump Room (Fire Area CHG)<br>Non-rated reinforced concrete to grade. |
| West Boundary: | Non-rated reinforced concrete to grade. |

**Note:** All penetrations between fire areas CHG and ABBM have been sealed with materials capable of achieving a three-hour fire rating (Section 5.3). In addition, fire doors and dampers separating fire area ABBM/fire zone ABB from fire area CHG have been upgraded (Section 5.4).

RHR Pit

Boundaries are non-rated to grade and/or non-rated to Fire Area ABBM/Fire Zone ABM.

Doors

- F1 - 3 hour rated fire door from Auxiliary Building to Spray Additive Tank Room (Fire Area CHG)
- F2 - 3 hour rated fire door from Auxiliary Building to Charging Pump Room (Fire Area CHG)

Dampers

- CP-3 - 3 hour rated curtain type fire damper in north wall to Charging Pump Room (Fire Area CHG)
- CP-4 - 3 hour rated curtain type fire damper in north wall to Charging Pump Room (Fire Area CHG)
- CP-10-1 - 3 hour rated curtain type fire damper in north wall to Charging Pump Room (Fire Area CHG)
- CP-10-2 - 3 hour rated curtain type fire damper in north wall to Charging Pump Room (Fire Area CHG)
- CP-10-3 - 3 hour rated curtain type fire damper in north wall to Charging Pump Room (Fire Area CHG)

- CP-10-4 - 3 hour rated curtain type fire damper in north wall to Charging Pump Room (Fire Area CHG)
- CP-12 - 3 hour rated curtain type fire damper in east wall to Charging Pump Room (Fire Area CHG)
- CP-13 - 3 hour rated curtain type fire damper in east wall to Charging Pump Room (Fire Area CHG)
- CP-13A - 3 hour rated curtain type fire damper in east wall to Charging Pump Room (Fire Area CHG)
- CP-31 - 3 hour rated curtain type fire damper to Spray Additive Tank Room (Fire Area CHG)

Special Provisions

- Hemyc wrap has been provided in this zone to protect the Charging Pump 1A power feed L398 for defense-in-depth.
- Flammastic was applied to all non IEEE-383 cables at the Auxiliary Building Cable Tunnel Smoke Barrier wall interface.

**Combustible Loading**

Floor Area = 9,590 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: Cable Insulation, Lube oil, Clothing, Fiberglass

**Potential Hazards**

- Hydrogen which can be isolated in the primary hydrogen bottle house.
- The cable tray south of the Charging Pump Room contains 480 volt cables along with Safe Shutdown Related cables.
- The safety injection pump motors, containment spray pump motors and motors on the ventilation equipment are all 480 volts.
- The residual heat removal pump and reactor coolant drain tank pumps have 480 volt motors.
- Oil from the Charging Pump Room is drained to the RHR Pit via sump pump and underfloor piping.
- Normally closed pressurized cylinders including a 2% hydrogen in nitrogen in the area of the waste gas sampling panel.
- Sodum hydroxide tank (charging pump room) fire area.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None.

**Engineering Evaluations**

- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94

- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations, dated 12/9/94
- DA-ME-95-154, Rev. 1, Auxiliary Building Operating Floor RWST Barrier Gap Penetration Seal A-803-P Evaluation, dated 11/30/95.
- DA-ME-95-148, Rev 0., Orifice LWD03 Removal Evaluation, Auxiliary Building Basement Sump Drain, Dated 10/10/95.
- DA-EE-94-054, Rev. 0, Ampacity of Cables Covered with HEMYC Fire Wrap, dated 6/15/98
- EWR 3986, Rev. 2, Effects of Heat Transfer to Fire Wrapped Conduit Through Conduit Supports During Potential Fires, dated 10/11/88
- EWR 3986-6, Rev. 0, Appendix R Fire Wraps, dated 12/15/89
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805
- DA-ME-94-118-05, Rev. 0, Fire Barrier Penetration Seal Qualification Analysis for Cable Tunnel Auxiliary Building Smoke Barrier

## Auxiliary Building Mezzanine Floor

**Fire Area ABBM**

**Fire Zone ABM**

**Elevation 253'-0"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

SAFW pump C MOV (9704A), SAFW pump D MOV (9704B), Aux Bldg DC distribution panel B (DCPCPAB01B), Aux Bldg DC distribution panel B1 (DCPDPAB02B), CCW to RHR Heat Exchanger MOVs (738A/B), CCW to RCPs MOVs (749A/B), CCW from RCPs MOVs (759A/B), CCW to containment MOV (817), seal or excess letdown return isolation MOV (313), EDG B supply to BUS16 (52/EG1B1), Containment pressure transmitters (PT-945 and PT-946), supply breaker to BUS16 (52/16), breaker for BUS16 to BUS14 tie (52/BT16-14), breaker for BUS16 to BUS15 tie (52/BT16-15), Aux building power distribution panel (ACPDPAB15), BUS16, MCCD, MCCM, Aux building MOVs from Service Water pump A/B/C/D (4616, 4615), Aux building service water isolation valve (4735), C SAFW pump SW suction line isolation valve (9626A), Level transmitter for VCT (LT-112), and Level transmitter for VCT instrument loop 139 (LT-139).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Waste Gas Compressor A and B

**Fire Protection**

Suppression System(s)

- S02 is an automatic deluge suppression system for the Auxiliary Building Charcoal Filter Unit G.
- S03 is an automatic pre-action suppression system over the cable trays in the west section.
- S04 is an automatic pre-action suppression system over the cable trays in the east section.
- S35 is an automatic sprinkler system at the Auxiliary Building East Stairs.
- S36 is an automatic sprinkler system at the Auxiliary Building West Stairs and Crane Hatch.
- Portable fire extinguishers are available in this fire zone.
- Hose stations are available in this fire zone.

Detection System(s)

- S02 heat detectors actuate suppression system S02.

- S03 smoke detectors actuate suppression system S03.
- S04 smoke detectors actuate suppression system S04.
- Z03 smoke detectors provide detection for the Auxiliary building west end.
- Pyrotronics area 1 zone 1 in ventilation system for concentrate tank room.
- Pyrotronics area 1 zone 2 provide detection in the ventilation system for the gas decay tank room, valve alley and concentrate holding tank room.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | 3 hour poured concrete to Auxiliary Building Operating Floor elevation 271'-0"<br>(Fire Area ABI/Fire Zone ABO) |
| Floor: | Non-rated reinforced concrete to Auxiliary Building Basement (Fire Area ABBM/Fire Zone ABB).<br>3 hour floor over the Charging Pump Room and NAOH Tank Room areas<br>(Fire Area CHG) |
| North Boundary: | Non-rated reinforced concrete to grade.<br>Greater than 3 hours to Containment<br>(Fire Area RC/Fire Zone RC-2) (See DA-ME-94-118-05)<br>Non-rated smoke barrier to Cable Tunnel<br>(Fire Area CT) (See DA-ME-94-118-05). |
| Northwest Boundary: | 3 hour rated to Intermediate Controlled side |
| South Boundary: | Non-rated reinforced concrete to grade. |
| East Boundary: | Non-rated reinforced concrete to grade. |
| West Boundary: | Non-rated reinforced concrete to grade and spent fuel pool structural support wall. |

**Note:** All penetrations in the ceiling to Fire Area ABI/Fire Zone ABO were sealed with materials capable of achieving a three-hour fire rating, with the exception of the gap around the RWST. The stairwell and hatch penetrations have been provided with suppression system enhancements. In addition, fire dampers were provided in the floor/ceiling assembly to Fire Area ABI/Fire Zone ABO.

Doors

- F3A1 - Non-rated smoke barrier door in north wall to Cable Tunnel (Fire Area CT) which is not operational (sealed closed)

Dampers

- A-21 - 3 hour rated curtain type fire damper in the ceiling to the Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)

- A-119 - 3 hour rated curtain type fire damper in the ceiling to the Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)

Special Provisions

- Hemyc wrap has been provided in the zone to protect circuits E53, C687, L398, L400, and tray 111 for defense-in-depth.

**Combustible Loading**

Floor Area = 10,570 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Charcoal, Cable Insulation, Fiberglass panels.

**Potential Hazards**

- Hydrogen which can be isolated in the primary hydrogen bottle house.
- Bus 16 has a 4160/480 volt transformer and lines coming in from the cable tunnel.
- Auxiliary Building Charcoal Filters.
- Auxiliary Building Charcoal Filter Unit G.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-101, Rev. 0, Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426, dated 2/28/92
- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations, dated 12/9/94
- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-94-118-05, Rev. 0, Fire Barrier Seal Qualification Analysis for Cable Tunnel Auxiliary Building Smoke Barrier (PENQ-05), dated 1/12/95
- DA-ME-94-118-09, Rev. 0, Fire Barrier Seal Qualification Analysis for Seismic Gap (PENQ-09), dated 1/13/95
- DA-ME-94-113, Rev. 0, Hydraulic Sprinkler Calculation for the Charcoal Unit G Deluge Fire Protection System S02/14, dated 1/16/95.

- DA-ME-95-154, Rev. 1, Auxiliary Building Operating Floor RWST Barrier Gap Penetration Seal A-803-P Evaluation, dated 11/30/95
- DA-EE-94-054, Rev. 0, Ampacity of Cables Covered with HEMYC Fire Wrap, dated 6/15/98
- EWR 3986, Rev. 2, Effects of Heat Transfer to Fire Wrapped Conduit Through Conduit Supports During Potential Fires, dated 10/11/88
- EWR 3986-6, Rev. 0, Appendix R Fire Wraps, dated 12/15/89
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## 7.2 Fire Area ABI

Fire Area ABI consists of ten fire zones on various elevations of the Intermediate Building and Auxiliary Building:

| | |
|---|---|
| Zone ABO | Auxiliary Building Operating Floor, Elevations 271'-0", 278'-4" & 281'-10" |
| Zone IB-0 | Intermediate Building Sub-Basement, Elevations 237'-0" & 238'-0" |
| Zone IBN-1 | Intermediate Building North, Elevation 253'-6" |
| Zone IBS-1 | Intermediate Building South, Elevation 253'-6" |
| Zone IBN-2 | Intermediate Building North, Elevation 278'-4" |
| Zone IBS-2 | Intermediate Building South, Elevation 271'-0" |
| Zone IBN-3 | Intermediate Building North, Elevation 298'-4" |
| Zone IBS-3 | Intermediate Building South, Elevation 293'-0" |
| Zone IBN-4 | Intermediate Building North, Elevation 315'-4" |
| Zone N2 | Nitrogen Storage Building, Elevation 271'-0" |
| Zone CPB | Canister Preparation Building, Elevation 269'-2" |

Fire zone ABO contains the Auxiliary Building Operating Floor which includes the upper elevations located on the operating floor. The 271'-0" elevation contains reactor auxiliary system equipment and waste handling equipment. The 278'-4" elevation is the operating level for new and spent fuel handling operations. The 281'-10" elevation contains the CCW Surge Tank and CCW Heat Exchanger B.

The intermediate building north is a multilevel structure which houses reactor auxiliary equipment and systems which do not process radioactively contaminated fluids, including the auxiliary feedwater system, equipment associated with the reactor control rod drive, ventilation equipment, main steam safety and isolation valves, and the remote shutdown panels.

The intermediate building bounds the north and west quadrants of the reactor containment wall. The north wall of the building is shared with the turbine building. This is a 12-inch concrete block wall at the 253'-6" and 271'-0" elevations. The west wall of the intermediate building is shared with the service building. This wall is also 12-inch concrete block with some 8-inch plastered block walls in the vicinity of the access control area at elevation 271'. The south wall is shared with the auxiliary building. This wall is reinforced concrete below elevation 278'-4" elevation and 12 inch concrete block above. The east wall is exposed to grade.

For purposes of the fire hazards analysis, the intermediate building was divided into zones by elevation and, on each elevation except the sub-basement, into a southern zone and a northern zone. The southern zone is a controlled access area due to radiological considerations and is separated from the rest of the building by a non rated concrete block wall erected in the vicinity of column lines H and I. The doors in this separating wall are for emergency use and are not fire rated. The floors between zones are reinforced concrete, open grating in various areas and stairwells are open.

IB-0 is the intermediate building sub-basement and is the only elevation in the Intermediate Building which is not divided into north and south zones. Normal access to this zone is through radiologically controlled areas (RCA). This zone contains no equipment but is provided for access to the foot of the reactor building via an open stairway at the south end from elevation 253'-6".

IBN-1 is the portion of the Intermediate Building North of column line H on elevation 253'-6". This fire zone is the clean side of this elevation and contains both Auxiliary Feedwater pumps, related equipment and cables. Normal access to the floors above is through this zone, although alternate escape routes are provided for the higher floors. Most of the safe shutdown related equipment in the Intermediate Building is located in this zone.

IBS-1 is that portion of the intermediate building, located south of column line H on elevation 253'-6". The wall between this zone and the service building is continuous, with sealed penetrations.

IBN-2 consists of the portion of the intermediate building north of column line H on elevation 278'-4". Normal access to this zone is from the floor below using the stairs at the east end. Emergency escape is possible through the door which opens into the southern portion of the intermediate building and a 3 hour rated door to the Turbine Building.

IBS-2 consists of the portion of the intermediate building south of column line H on elevation 278'-4". This zone contains the personnel access control point for access to all the radiological control areas in the plant and the containment personnel hatch. This zone is separated from the Service Building by a 3-hour rated wall except at the access point where there are 2-hour rated walls. The wall between this zone and the Auxiliary Building is 3-hour rated. The openings for the spent fuel pool ventilation cleanup charcoal filters are provided with 3 hour rated dampers. Although these filters are located on the intermediate building side of the wall, the wall is open to the filters for air flow from the spent fuel pool in the auxiliary building.

IBN-3 consists of the portion of the intermediate building north of column line H on elevation 298'-4" and houses ventilation equipment not required for safe shutdown and the radiation monitoring equipment for the plant vents. Normal access is through the stairs on the east side. Emergency escape is possible through the southern zones of the intermediate building through an unrated door and through doors on the lower levels of the Intermediate Building. There is no safe shutdown related equipment located in this zone.

IBS-3 consists of the portion of the intermediate building south of column line H on elevation 293'-0" and houses plant ventilation equipment. This zone does not contain safe shutdown related equipment.

IBN-4 consists of the entire intermediate building located on elevation 315'-4". This zone does not contain safe shutdown related equipment.

N2 is the Nitrogen Storage Building located on grade at the east end of the Auxiliary Building. The building is used for storage of nitrogen. The west end of the Nitrogen Storage Building is adjacent to the Auxiliary Building wall. This wall is constructed of 8" concrete block up to elevation 281'-0" and metal siding above that elevation. The 8" concrete block is ratable as a 2

hour fire barrier. The metal siding is not ratable as a 2-hour barrier and is part of the wall barrier that separates N2 from the Auxiliary Building Operating Floor (ABO). The south wall of the building is constructed of 12" poured concrete. The east and north walls and the roof are sheet metal siding. There is no safe shutdown equipment in the Nitrogen Storage Building.

CPB is the Canister Preparation Building located on grade at the south end of the Auxiliary Building. The building houses a 125 ton crane used for preparation of dry fuel storage canisters. The west wall interface to the SB is constructed partially of 12" hollow core block and the remainder being 8" solid block. The east wall interface to the CSB is constructed of 12" hollow block. Both these wall sections are 3 hour fire rated. The remainder of the walls/roofs are not fire rated.

## Auxiliary Building Operating Floor

**Fire Area ABI**

**Fire Zone ABO**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Aux building exhaust fan G (AAF04), Aux building DC distribution panels DCPDPAB01A, DCPDPAB02A, DCPDPAB03A, CCW pump A/B (PAC02A/B), CCW heat exchanger A/B (EAC01A/B), EDG A supply to BUS 14 (52/EG1A1), MCCC, MCCL, BUS14, 52/14, 52/BT14-13, aux building power distribution panel AB-14 (ACPDPAB14), and Aux building service water isolation valve (4734), and service water inlet valve to SAFW pump room (9626B).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Containment Penetration Cooling fans A and B, Spent Fuel Pool Heat Exchanger B, Bus 14 UV Cabinet, MCCE, Boric Acid Storage Tanks and Pumps A and B, Reactor Makeup Water Tank, and Monitor Tank Pump

### Fire Protection

Suppression System(s)

- S35 is an automatic sprinkler system that provides suppression for the east stairs to Fire Area ABBM/Fire Zone ABM below.
- S36 is an automatic sprinkler system that provides suppression for the west stairs and equipment hatch to Fire Area ABBM/Fire Zone ABM below.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.

Detection System(s)

- Z04 smoke detectors provide detection over the central and east portions of the Operating Floor.
- Z35 smoke detectors provide detection over the spent fuel pit area in the west end of the Operating Floor.
- Pyrotronics area l zone 3 in the ductwork of Auxiliary Building Exhaust Fan C.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior (Fire Area YARD) |
| Floor: | 3 hour rated poured concrete approximately l8" thick to Auxiliary Mezzanine elevation (Fire Area ABBM/Fire Zone ABM). |
| North Boundary: | Greater than 3 hour rated poured concrete to Containment (Fire Area RC/Fire Zones RC-2 and RC-3)<br>3 hour rated* to Intermediate Building (*DA-ME-15-007) (Fire Area ABI/Fire Zones IBS-l, IBS-2, IBS-3)<br>**Note:** The north wall of the Spent Fuel Pit borders Fire Zone IBS-l.<br>Non-rated poured concrete and metal siding material to exterior Transformer Yard Area (Fire Area Yard) (East of the Containment Building interface) |
| South Boundary: | 3 hour rated to Standby Auxiliary Feedwater Building (Fire Area SAF)<br>2 hour rated concrete block to Standby Auxiliary Feedwater Building corridor (Fire Area SAF)<br>3 hour rated l2" hollow concrete block to Service Building (Fire Area BOP/Fire Zones SB-lWT and SB-2)<br>Non-rated poured concrete and metal siding to exterior (Fire Area YARD)<br>Rated fire door to Contaminated Storage Building Corridor (Fire Area WS)<br>Non-rated door to Canister Preparation Building (Fire Zone CPB) |
| East Boundary: | Non-rated poured concrete and metal siding material to Nitrogen Storage Building (Fire Area ABI/Fire Zone N2)<br>Non-rated poured concrete and metal siding material to exterior yard area (Fire Area YARD) |
| West Boundary: | 3 hour rated to Service Building (Fire Area BOP/Fire Zones SB-lWT and SB-2) |

Doors

- F503 - 3 hour rated fire door in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- S29F (active leaf) and S29F-1 (inactive leaf) - 3 hour rated double fire door in south wall to Contaminated Storage Building corridor (Fire Area WS).
- SD/30 - Non-rated door in south wall to Canister Preparation Building (Fire Zone CPB)

Dampers

- A-21 - 3 hour rated curtain type fire damper in the floor to the Auxiliary Building elevation 253'-6" (Fire Area ABBM/Fire Zone ABM)
- A-119 - 3 hour rated curtain type fire damper in the floor to the Auxiliary Building elevation 253'-6" (Fire Area ABBM/Fire Zone ABM)
- I-317 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire

Area ABI/Fire Zone IBS-3)

- I-318-1 - 3 hour rated curtain type fire damper in west wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-3)
- I-318-2 - 3 hour rated curtain type fire damper in west wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-3)
- I-318-3 - 3 hour rated curtain type fire damper in west wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-3)
- I-318-4 - 3 hour rated curtain type fire damper in west wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-3)
- I-411-1 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-2 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-3 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-4 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-5 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-6 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-7 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-8 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-9 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-10 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-11 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-12 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-13 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-14 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-15 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-16 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-17 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire

Area ABI/Fire Zone IBS-2)

- I-411-18 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-19 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-20 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-411-21 - 3 hour rated curtain type fire damper in north wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)

Special Provisions

- None

**Combustible Loading**

Floor Area = 12,740 ft$^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/ft$^2$)
Major Combustibles: Cable Insulation, Lube Oil, Powder Resin

**Potential Hazards**

- 480 volt MCCs and power distribution cabling
- Hydrogen supply piping is routed through this zone which can be isolated in the Primary Hydrogen Bottle House
- Charcoal filters north of Spent Fuel Pool will burn with a very intense heat.
- Hydraulic oil in trash compactor
- Possible carcinogenic - chromates in component cooling water
- Falling hazards - decon pit and crane bays
- Oxidizer - $O_2$ running by Spent Fuel Pit area
- Boric acid and resins in the north east present a toxic hazard
- House heating steam - isolation at valve 6299 (above C fan) in the controlled Intermediate Building
- Process steam to boric acid evaporator - isolated at valve 6269 (above C fan) in the controlled Intermediate Building
- Various compressed gas bottles
- Locker containing sodium hydroxide

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94
- ME-92-0006, Rev. 0, Analysis of Pen's and Fire Barriers: Standing Auxiliary Feedwater and Auxiliary Building Interface, dated 2/28/92
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-94-118-09, Rev. 0, Fire Barrier Seal Qualification Analysis for Seismic Gap (PENQ-09), dated 1/13/95
- DA-ME-95-154, Rev. 1, Auxiliary Building Operating Floor RWST Barrier Gap Penetration Seal A-803-P Evaluation, dated 11/30/95
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805
- DA-ME-15-007, Rev. 0, Evaluation of 3 hr. block wall between fire zones ABO and IBS-3.

## Intermediate Building Sub-Basement

**Fire Area ABI**

**Fire Zone IB-0**

**Elevations 237'-0" and 238'-6"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Sump Pumps, and Seismic Monitor

### Fire Protection

Suppression System(s)

- Portable fire extinguishers are available at the stairwell down to the sub-basement in ABI/ IBN-l.
- Hose reel coverage is provided from ABI/IBS-l via the stairwell and from ABI/IBN-l via the manways. Refer to DA-ME-92-l45 which evaluates the hose reel coverage.

Detection System(s)

- Z36 photo electric detection provides protection for this area.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Intermediate Building elevation 253'-6" (Fire Area ABI/ Fire Zones IBN-l and IBS-l) except at the smoke barrier to the Cable Tunnel Entrance. |
| Floor: | Non-rated poured concrete to grade. |
| North Boundary: | Non-rated poured concrete to grade. |
| South Boundary: | Greater than 3 hour rated construction to Containment (Fire Area RC/ Fire Zone RC-l) |
| East Boundary: | Greater than 3 hour rated construction to Containment (Fire Area RC/ Fire Zone RC-l)<br>Non-rated poured concrete to grade. |

| Boundaries | |
|---|---|
| West Boundary: | Non-rated poured concrete to grade. |

Doors

- None

Dampers

- None

Special Provisions

- Manways which are installed for flooding potential drainage in the ceiling could be utilized for manual fire fighting.

**Combustible Loading**

Floor Area = 6,175 $ft^2$

Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)

Major Combustibles: Lube Oil, Cable Insulation, Epoxy

**Potential Hazards**

- TDAFW Lube Oil piping is routed in the north section of this zone.
- Epoxy materials in area of containment tendons.

**Exemptions**

- None

**Engineering Evaluations**

- DA-ME-92-145, Rev. 0, Controlled Intermediate Building Sub-Basement Fire Protection Systems Evaluation, dated 12/1/92 discusses hose reel coverage.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.

## Intermediate Building North

**Fire Area ABI**

**Fire Zone IBN-1**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Aux Feedwater pump A/B (PAF01A/B), TDAFW pump (PAF03), Turbine Building service water MOV (4614), TDAFW pump discharge MOV (3996), AFW crossover valves (4000A/B), flow control valve to S/G B (4002), MDAFW pump A/B discharge MOV (4007/4008), SW inlet valve (4098) to TDAFW pump, TDAFW pump recirc valve (4291), TDAFW pump flow control valves to S/G A/B (4297/4298), TDAFW pump SW suction line telltale isolation valve (4358D), TDAFW pump discharge flow indicator on IBELIP panel (FI-2015A), MDAFW pump A/B flow transmitters (FT-2001/FT-2002), TDAFW pump AC lube oil pump (PLO10), and DC lube oil pump (PLO11), containment pressure transmitters (PT-949 and PT-950), Intermediate Building Local Instrument panel (IBELIP), S/G “A” level on IBELIP (LI-460AA), S/G “B” wide range level on IBELIP (LI-506A), TDAFW speed control EH valve (9519E), S/G “A” pressure indicator on IBELIP (PI-469A), S/G “A” pressure transmitters (PT-468 and PT-482), S/G “B” pressure transmitter (PT-483), RCS loop indication on IBELIP (TI-409A-2), reactor trip breaker A/B (52/RTA and 52/RTB), S/G A/B blowdown isolation valves (5738 and 5737), TDAFW pump service water suction MOV (4013), A/C Service water MOVs (4663 and 4733), Turbine building SW isolation valve (4664), TDAFW pump SW strainer bypass SOV (4324).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment**: Rod Drive Cabinets, Rod Drive MG Sets, and A and B Chiller Units

**Fire Protection**

Suppression System(s)

- S14 is a manual deluge suppression system for the Turbine Driven Auxiliary Feedwater Pump Area and oil transfer pump area.
- S15 is an automatic pre-action suppression system for the cable trays in this zone.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.

Detection System(s)

- S14 heat detectors provide annunciation of conditions in the Control Room. This will result in operator response and manual actuation of system S14.
- S15 smoke detectors actuate suppression system S15.
- Z22 smoke detectors provide detection over the Auxiliary Feedwater Pumps.

## Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Intermediate Building elevation 278'-4" (Fire Area ABI/ Fire Zone IBN-2) |
| Floor: | Non-rated to Intermediate Building Sub-Basement elevations 237'-0" and 238'-0" (Fire Area ABI/Fire Zone IB-0) except at the Cable Tunnel entrance smoke barrier. |
| North Boundary: | 3 hour rated 12" thick hollow concrete block to the Turbine Building with pyrocrete upgrades (Fire Area BOP/Fire Zones TB-1 and TB-2) |
| South Boundary: | Non-rated 8" thick hollow concrete block to the Intermediate Building Controlled side (Fire Area ABI/Fire Zone IBS-1)<br>Greater than 3 hour fire separation to Containment (Fire Area RC/ Fire Zone RC-1) |
| East Boundary: | Partial 3 hour rated masonry wall to Cable Tunnel Wall barrier (Fire Area CT)<br>Non-rated but justified smoke barrier to Cable Tunnel Entrance (Fire Area CT) (See DA-ME-94-118-04)<br>Non-rated poured concrete to grade. |
| West Boundary: | 3 hour rated 12" thick hollow concrete block to the Service Building (Fire Area BOP/Fire Zones SB-1 and SB-2) |
| Stairtower: | 3 hour rated 12" thick hollow concrete block with pyrocrete upgrades. |

Doors

- F3 - 1 1/2 hour rated fire door in east wall to Cable Tunnel (Fire Area CT).
- F36 - 3 hour rated rolling fire door in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-1)
- S37F (active leaf) and S37F-1 (inactive leaf) - 3 hour rated double fire door in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-1).

Dampers

- None

Special Provisions

- Hemyc wrap protects the conduit and instrumentation for PT478 (R975) (S/G B pressure transmitter) for defense-in-depth.
- Hemyc wrap protects the conduit and instrumentation for N31 source range monitor and circuits R1468, R1472, and R1475 for defense-in-depth.

- Check valves have been installed in drain piping to prevent backflow. (Refer to EWR 2720)
- Flammastic was applied to all Non IEEE-383 cables at the cable tunnel smoke barrier interface.

**Combustible Loading**

Floor Area = 3,570 ft$^2$

Equivalent Fire Severity Classification: MEDIUM (60,000 BTU/ft$^2$ to less than 120,000 BTU/ft$^2$)

Major Combustibles: Lube Oil, Cable Insulation, Fiberglass Ladders, Plastic

**Potential Hazards**

- Auxiliary Feedwater Pumps and various other equipment are 480V power feeds.
- An oil transfer pump fire could develop if oil leaks from the Turbine Driven Auxiliary Feedwater Lube Oil Reservoir. The area is diked to control an oil spill.
- The Containment Hydrogen monitor and associated pressurized gas cylinder is in this area.
- There is a heavy concentration of 480V power cables in this area.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-101, Rev. 0, Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426, dated 2/28/92
- DA-ME-92-106, Rev. 1, Analysis of Steel Fire Protection and Fire Barriers, dated September 6, 1995
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations, dated 12/9/94
- DA-ME-94-118-04, Rev. 0, Fire Barrier Penetration Seal Qualification Analysis for Cable Tunnel Intermediate Smoke Barrier (PENQ-04), dated 1/12/95
- EWR 3986, Rev. 2, Effects of Heat Transfer to Fire Wrapped Conduit Through Conduit Supports During Potential Fires, dated 10/11/88
- EWR 3986-6, Rev. 0, Appendix R Fire Wraps, dated 12/15/89
- ME-91-0015, Rev. 0, Fire Water Spray for TDAFW pump, dated 02/22/91
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## Intermediate Building South

**Fire Area ABI**

**Fire Zone IBS-1**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Pressurizer steam sample AOV (966A), Pressurizer liquid sample AOV (966B), Loop B hotleg sample AOV (966C), PASS purge AOV to VCT (426), PASS sample cooler outlet flow HCV (10016), PASS sample cooler outlet AOV to PASS liquid and Gas sample panel (10017), and PASS LGSP liquid ample/purge selection MOV (10103G).

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Hydrogen Recombiner Controls, SFP Skimmer Pump, and PASS panel.

**Fire Protection**

Suppression System(s)

- Portable fire extinguishers are available in this zone.
- A hose station is available in this zone.

Detection System(s)

- Z38Dl photo electric detectors provide detection for this zone.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Intermediate Building elevation 27l'-0" (Fire Area ABI/ Fire Zone IBS-2) |
| Floor: | Non-rated to Intermediate Building elevations 237'-0" & 238'-0" (Fire Area ABI/Fire Zone IB-0) |
| North Boundary: | Non-rated 8" thick hollow concrete block to Intermediate Building North (Fire Area ABI/Fire Zone IBN-l) |
| South Boundary: | Greater than 3 hour rated poured concrete to Auxiliary Building Spent Fuel Pit (Fire Area ABI/Fire Zone ABO) |
| East Boundary: | Greater than 3 hour rated poured concrete to Containment (Fire Area RC/Fire Zone RC-2) |

| Boundaries | |
|---|---|
| West Boundary: | 3 hour rated 12" thick hollow concrete block to Service Building (Fire Area BOP/Fire Zones SB-1HS and SB-1WT) |

<u>Doors</u>

- F509 - 3 hour rated fire door to the Service Building Hot Shop (Fire Area BOP/Fire Zone SB-1HS)

<u>Dampers</u>

- I-27 - 3 hour rated curtain type fire damper to the Service Building Hot Shop (Fire Area BOP/Fire Zone SB-1HS)

<u>Special Provisions</u>

- None

**Combustible Loading**

Floor Area = 2,325 ft$^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/ft$^2$)
Major Combustibles: Cable Insulation, Charcoal, Plastic

**Potential Hazards**

- 480 volt cables are located in the Cable Trays overhead
- A fire in the Controlled Access Area Charcoal Filter Unit or Spent Fuel Pool Charcoal Filters can burn with a very intense heat if they catch fire.
- Hydrogen piping is routed through the zone and can be isolated in the primary hydrogen bottle house.
- Various compressed gas cylinders.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94
- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations, dated 12/9/94
- DA-ME-94-118-09, Rev. 0, Fire Barrier Seal Qualification Analysis for Seismic Gap (PENQ-09), dated 1/13/95
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.

## Intermediate Building North

**Fire Area ABI**

**Fire Zone IBN-2**

**Elevation 278'-4"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

SG A/B ARVs (3411/3410), SG A/B MOV to TDAFWP (3505A/3504A), SG A/B safety valves (3508, 3509, 3510, 3511, 3512, 3513, 3514, and 3515), and Main Steam A/B isolation valves (3517/3516).

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.

Detection System(s)

- Z37D1 photo electric detectors provide detection for this area.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Intermediate Building elevation 298'-4" (Fire Area ABI/ Fire Zone IBN-3) |
| Floor: | Non-rated to Intermediate Building elevation 253'-6" (Fire Area ABI/ Fire Zone IBN-1) |
| North Boundary: | 3 hour rated 12" thick hollow concrete block to the Turbine Building (Fire Area BOP/Fire Zones TB-2 and TB-3)<br><br>South Boundary: Non-rated 8" thick hollow concrete block to the Intermediate Building Controlled side (Fire Area ABI/Fire Zone IBS-2)<br><br>Greater than 3 hour rated poured concrete to containment (Fire Area RC/Fire Zone RC-3) |

| Boundaries | |
|---|---|
| East Boundary: | Non-rated 12" thick hollow concrete block to exterior (Fire Area YARD) Portions of wall are covered with ¼” steel plant on the IB side of wall) |
| West Boundary: | 3 hour rated 12" thick hollow concrete block to Service Building (Fire Area BOP/Fire Zone SB-2) Portions of wall are covered with ¼” steel plant on the IB side of wall) |
| Stairtower: | 3 hour rated 12" thick hollow concrete block with pyrocrete upgrades. Portions of wall are covered with ¼” steel plant on the IB side of wall |

Doors

- S44F - 3 hour rated fire door to the Turbine Building elevation 271'-0" (Fire Area BOP/Fire Zone TB-2)

Dampers

- I-350-1 - 1 1/2 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2) (Old Laundry room ventilation system)
- I-350-2 - 1 1/2 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2) (Old Laundry room ventilation system)

**Note:** Fire dampers I-350-1 and I-350-2 are installed back-to-back and maintained in closed position to provide a 3 hour combined rating. Refer to DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94.

Special Provisions

- None

**Combustible Loading**

Floor Area = 3,570 ft$^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/ft$^2$)
Major Combustibles: Cable Insulation

**Potential Hazards**

- Various high energy piping

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-106, Analysis of Steel Fire Protection and Fire Barriers, dated September 6, 1995
- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94
- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations, dated 12/9/94
- DA-ME-94-118-08, Rev 0, Fire Barrier Penetration Seal Qualification Analysis for Snubber Detail (PENQ-08), dated 1/13/95
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## Intermediate Building South

**Fire Area ABI**

**Fire Zone IBS-2**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Containment pressure transmitters PT-947 and PT-948, Pressurizer steam space PASS sampl AOV to sample cooler rack (10000), Pressurizer liquid space PASS sample AOV to sample cooler rack (10001), RC LOOPB Hot leg PASS sample AOV to sample cooler rack (10002).

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** R-19, Primary sample hood and sample room.

### Fire Protection

Suppression System(s)

- Portable fire extinguishers are available in this zone.

Detection System(s)

- Z38D2 photo electric detectors provide detection for this area.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Intermediate Building elevation 293'-0" (Fire Area ABI/ Fire Zone IBS-3) |
| Floor: | Non-rated to Intermediate Building elevation 253'-6" (Fire Area ABI/ Fire Zone IBS-1) |
| North Boundary: | Non-rated 8" thick hollow concrete block to Intermediate Building North (Fire Area ABI/Fire Zone IBN-2) |
| South Boundary: | 3 hour rated 12" thick hollow concrete block to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO) |
| East Boundary: | Greater than 3 hour rated poured concrete to Containment (Fire Area RC/Fire Zones RC-2 and RC-3)<br><br>3 hour rated 12" thick hollow concrete block to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO) (wing wall) |

| Boundaries | |
|---|---|
| West Boundary: | 3 hour rated 12" thick hollow concrete block to Service building (Fire Area BOP/Fire Zone SB-2) except for portion of the wall in the area of doors S65F and S46F which is 2 hour rated 8" thick hollow concrete block. |

Doors

- S46F - 3 hour rated fire door in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- S65F - 3 hour rated fire door in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- F503 - 3 hour rated fire door in south wall to Auxiliary Building (Fire Area ABI/Fire Zone ABO)
- F510 - 3 hour rated fire door (HP pass box) in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)

Dampers

- I-340-1 - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- I-340-2 - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- I-411-1 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-2 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-3 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-4 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-5 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-6 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-7 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-8 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-9 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)

- I-411-10 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-11 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-12 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-13 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-14 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-15 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-16 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-17 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-18 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-19 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-20 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-411-21 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)

Special Provisions

- None

## Combustible Loading

Floor Area = 2,385 ft$^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/ft$^2$)
Major Combustibles: Charcoal, Cable Insulation

## Potential Hazards

- Spent Fuel Pit Charcoal Filters will burn with an intense heat if they catch fire.
- Hydrogen and Oxygen lines are routed through this area. Hydrogen piping can be isolated in the Primary Hydrogen Storage building.

## NRC Approvals from NFPA 805 Chapter 3 Requirements

- None

## Engineering Evaluations

- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations, dated 12/9/94
- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94
- DA-ME-93-119, Rev 0, Analysis of Replacement Fire Dampers for AH-44, BA-33 and BB-46, dated October 21, 1993.
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-94-118-09, Rev. 0, Fire Barrier Seal Qualification Analysis for Seismic Gap (PENQ-09), dated 1/13/95
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0,Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.

## Intermediate Building North Fan Floor

**Fire Area ABI**

**Fire Zone IBN-3**

**Elevation 298'-4"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Purge Exhaust Fans and Mini Purge Supply Fan, SPING Units R-12 and R-14A.

### Fire Protection

Suppression System(s)

- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.

Detection System(s)

- Z37D2 photo electric detectors provide detection for the zone.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Intermediate Building elevation 315'-4" (Fire Area ABI/ Fire Zone IBN-4) |
| Floor: | Non-rated to Intermediate Building elevation 278'-4" (Fire Area ABI/ Fire Zone IBN-2) |
| North Boundary: | 3 hour rated 12" thick hollow concrete block to the Turbine Building (Fire Area BOP/Fire Zone TB-3) |
| South Boundary: | Non-rated 8" thick hollow concrete block to the Intermediate Building Controlled side (Fire Area ABI/Fire Zone IBS-3)<br><br>Greater than 3 hour rated poured concrete to containment (Fire Area RC/Fire Zone RC-3) |

| Boundaries | |
|---|---|
| East Boundary: | Non-rated 12" thick hollow concrete block to exterior (Fire Area YARD) |
| West Boundary: | Non-rated to exterior above Service Building roof. |
| Stairtower: | 3 hour rated 12" thick hollow concrete block with pyrocrete upgrades. |

Doors

- None

Dampers

- None

Special Provisions

- None

**Combustible Loading**

Floor Area = 3,570 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: Cable Insulation, Plastic

**Potential Hazards**

- Purge exhaust fans are 480 volt.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## Intermediate Building South

**Fire Area ABI**

**Fire Zone IBS-3**

**Elevation 293'-0"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Various plant ventilation equipment

### Fire Protection

Suppression System(s)

- Portable fire extinguishers are available in this zone.
- Hose reel suppression coverage is available from IBN-3 on elevation 298'-4" and from IBS-2 on elevation 271'0". Refer to DA-ME-94-004.

Detection System(s)

- Z38D3 photo electric detectors provide detection for this area.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to Intermediate Building elevation 271'-0" (Fire Area ABI/ Fire Zone IBS-2) |
| North Boundary: | Non-rated 8" thick hollow concrete block to Intermediate Building North (Fire Area ABI/Fire Zone IBN-3) |
| South Boundary: | 3 hour rated *12" thick hollow concrete block to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO) *(DA-ME-15-007) |
| East Boundary: | Greater than 3 hour rated poured concrete to Containment (Fire Area RC/Fire Zone RC-3)<br><br>3 hour rated 12" thick hollow concrete block to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO) (wing wall) |

| Boundaries | |
|---|---|
| West Boundary: | Non-rated to exterior. |

Doors

- None

Dampers

- I-317 - 3 hour rated curtain type fire damper in south wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-318-1 - 3 hour rated curtain type fire damper in east wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-318-2 - 3 hour rated curtain type fire damper in east wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-318-3 - 3 hour rated curtain type fire damper in east wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)
- I-318-4 - 3 hour rated curtain type fire damper in east wall to Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO)

Special Provisions

- None

**Combustible Loading**

Floor Area = 2,325 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Cable Insulation

**Potential Hazards**

- Power supply to air handling equipment is 480 volts.
- Main plant vent exhaust fans power supply are 4160 volts.
- Various compressed gas cylinders.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94
- DA-ME-94-004, Fire Protection Hose Reels, dated 1/12/94

- DA-ME-94-118-09, Rev. 0, Fire Barrier Seal Qualification Analysis for Seismic Gap (PENQ-09), dated 1/13/95
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.
- DA-ME-15-007, Rev. 0, Evaluation of 3 hr. block wall between fire zones ABO and IBS-3.

## Intermediate Building North

**Fire Area ABI**

**Fire Zone IBN-4**

**Elevation 315'-4"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Containment Purge Exhaust Charcoal Filters A and B, R-10A, 11, 12 skid containment monitor, and R-10B, 13, 14 skid Auxiliary Building monitor.

### Fire Protection

Suppression System(s)

- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.

Detection System(s)

- Z23 smoke detectors provide detection for the containment purge exhaust filter A duct-work.
- Z24 smoke detectors provide detection for the containment purge exhaust filter B duct-work.
- Z37D3 photo electric detectors provide detection for this zone.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to Intermediate Building elevation 298'-4" (Fire Area ABI/ Fire Zone IBN-3) |
| North Boundary: | 3 hour rated 12" thick hollow concrete block to Turbine Building Operating Floor (Fire Area BOP/Fire Zone TB-3) |

| Boundaries | |
|---|---|
| South Boundary: | Non-rated to exterior.<br><br>Greater than 3 hour rated poured concrete to containment (Fire Area RC/Fire Zone RC-3) |
| East Boundary: | Non-rated 12" thick hollow concrete block to Fire Area YARD. |
| West Boundary: | Non-rated to exterior above Service Building roof. |
| Stairtower: | 3 hour rated 12" thick hollow concrete block with pyrocrete upgrades. |

Doors

- None

Dampers

- None

Special Provisions

- None

**Combustible Loading**

Floor Area = 3,430 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: Charcoal, Plastic

**Potential Hazards**

- Containment Purge Exhaust Charcoal Filters A and B will burn with an intense heat if they catch fire.
- Various compressed gas cylinders.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None.

**Engineering Evaluations**

- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions For Transition to NFPA 805.

## Nitrogen Storage Building

**Fire Area ABI**

**Fire Zone N2**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- No fixed suppression systems have been provided.
- Portable fire extinguishers are available in this area/zone.
- Manual hand lines are available in the adjacent yard area via yard hydrant connections.

Detection System(s)

- No fixed detection systems have been provided.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to grade. |
| North Boundary: | Non-rated sheet metal siding to exterior. |
| South Boundary: | Non-rated 12" poured concrete to exterior. |
| East Boundary: | Non-rated sheet metal siding to exterior. |
| West Boundary: | Non-rated 8" concrete block and brick (up to 281'-0") and metal siding to the Auxiliary Building Operating Floor (Fire Area ABI/Fire Zone ABO) |

Doors

- None

Dampers

- None

Special Provisions

- None

**Combustible Loading**

Floor Area = 430 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: None

**Potential Hazards**

- Keep the pressurized nitrogen tanks from becoming hot, should their safety valves blow open, nitrogen which will not burn or explode but will be released into the room.

**NRC Approval from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-079, Rev. 0, Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI, dated 9/26/00.
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions For Transition to NFPA 805.

## Canister Preparation Building

**Fire Area ABI**

**Fire Zone CPB**

**Elevation 269'-2"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** 125 Ton Crane (COHCPB01)

### Fire Protection

Suppression System(s)

- S51 is an automatic dry pipe suppression system which provides suppression protection for the CPB proper and respective equipment rooms, electrical and mechanical.
- Portable fire extinguishers are available in this area/zone.
- Hose Stations are available in this zone.

Detection System(s)

- No fixed detection systems have been provided.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to grade. |
| North Boundary: | Non-rated block and metal siding to Auxiliary Building |
| South Boundary: | Non-rated 12" poured concrete to exterior. |
| East Boundary: | 3 hour rated block to CSB (Fire Area WS)<br>Non-rated block and metal siding to exterior |
| West Boundary: | 3 hour rated block to SB (Fire Area BOP / Zone SB-2)<br>Non-Rated block and metal siding to exterior |

Doors

- SD/30 - Non-rated door in north wall to Auxiliary Building (Fire Area ABO)
- S/100BF - 3 hour rated fire door in east wall to Contaminated Storage Building (Fire Area WS)

- F101C - 2 hour rated fire door to the CPB Mechanical Equipment Room
- F101A - 2 hour rated fire door to the CPB Electrical Equipment Room

Dampers

- None

Special Provisions

- None

**Combustible Loading**

- Floor Area = 6232 $ft^2$
  Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
  Major Combustibles: Crane oil & Hydraulic Fluid, Crane cables

**Potential Hazards**

- High voltage crane cables

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- Appendix R/Fire Protection conformance verification checklist for PCR 2004-0069, Revision 0.

## 7.3 Fire Area BOP

Fire Area BOP is a Balance of Plant fire area and consists of fifteen fire zones on various elevations of the Condensate Demineralizer Building, Hydrogen Storage Building, Service Building, Turbine Building, Turbine Oil Storage Building, Ginna Admin Building and Technical Support Center:

| | |
|---|---|
| Zone AVT | Condensate Demineralizer Building, Elevation 253'-6" |
| Zone H2 | Hydrogen Storage Building, Elevation 253'-6" |
| Zone SB-1 | Basement, Elevation 253'-6" |
| Zone SB-1HS | Hot Shop, Elevation 253'-6" |
| Zone SB-1WT | Water Treatment Room, Elevations 253'-6" & 271'-0" |
| Zone SB-2 | Office Level, Elevation 271'-0" (Excludes area above SB-1WT) |
| Zone TB-1 | Basement, Elevation 253'-6" & DI Trucks |
| Zone TB-1FP | Feedpump Room, Elevation 253'-6" |
| Zone TB-2 | Intermediate Floor, Elevation 271'-0" |
| Zone TB-3 | Operating Floor, Elevation 289'-6" |
| Zone TO | Turbine Oil Storage Building, Elevation 253'-6" |
| Zone TSC-1M | Technical Support Center, Elevation 271'-0" (Mechanical Equipment Room and Administrative Computer) |
| Zone TSC-1N | Technical Support Center, Elevation 271'-0" |
| Zone TSC-1S | Technical Support Center, Elevation 271'-0" (South of Corridor) and includes the TSC Diesel Generator, Inverter, and Battery rooms |
| Zone GAB | Ginna Admin Building, 271'-0" |

The Condensate Demineralizer Building is a reinforced concrete structure bordering on the east end of the turbine building. The building is a two story structure and comprises four fire zones (Fire zones AVT, TSC-1S, TSC-1M, and TSC-1N). The first level consists of fire zone AVT and houses equipment for condensate treatment and does not contain equipment required for safe shutdown. The second level houses the Technical Support Center (Fire Zones TSC-1S, TSC-1M, and TSC-1N) and also includes the TSC Diesel Generator Room, TSC Battery Room, TSC Inverter Room and the South Corridor. Zones TSC-1M and TSC-1N do not contain equipment required for safe shutdown. Zone TSC-1S contains the TSC batteries, emergency diesel generator, battery charger, and battery fused DC disc switch used for safe shutdown. Pyrocrete structural steel upgrades have been provided in the second story barriers to the Turbine Building where structural steel interfaced with block wall material construction.

Fire Zone H2, the Hydrogen Storage Building, is a small building to the north of the Turbine Building. The facility is used for storing cylinders of hydrogen and carbon dioxide. The building does not contain equipment required for safe shutdown. The building is separated from the Turbine Building on the south by a 12-inch concrete block wall and from the Turbine Oil Stor-

age Building on the east by a 12-inch reinforced concrete wall, both of which have a fire resistance rating exceeding 3 hours. The north and west walls of the building are metal siding and are exposed to the exterior.

The Service Building is a two story structure comprising of four fire zones (Fire Zones SB-1, SB-1HS, SB-1WT, and SB-2). The Service Building houses office areas, laboratories, a lunch room, and locker facilities on the upper elevation and storage areas, water treating areas, stockroom and shops on the lower elevation.

The Service Building is bounded on the east by the Intermediate Building, Auxiliary Building, and Turbine Building. The north, south, and west walls are exposed to the exterior and to grade. The wall separating this fire zone from adjacent zones and fire areas are ratable as 3-hour fire barriers, with the exception of a small section of 2-hour rated wall between the controlled access area and the Intermediate Building Controlled Side. The 3-hour rated section of the wall is reinforced concrete or 12-inch concrete block. The 2-hour rated section is an 8-inch block wall. Pyrocrete structural steel protection has been provided in zones SB-1 and SB-2 where structural steel interfaced with block wall material construction at the Turbine Building interface.

The Turbine Building consists of four fire zones on three elevations. Each floor represents a separate fire zone (Fire Zones TB-1, TB-2, and TB-3). A separate fire zone constitutes the feedwater pump room (TB-1FP). The floors are reinforced concrete with numerous penetrations and metal gratings where equipment spans more than one floor. The roof of the Turbine Building is a metal deck roof on unprotected steel with a Factory Mutual Class I rated roof covering.

The equipment in the Turbine Building includes the turbine, generator, exciter, lubricating oil storage and handling equipment, condensers, electrical distribution equipment, the hydrogen seal oil system and related turbine generator equipment. The building is bounded on the north by the diesel generator building, the turbine oil storage area, the hydrogen storage area, and potentially two DI trucks. These areas, with the exception of the DI trucks, are separated from the Turbine Building by a 12-inch thick concrete block wall with a fire resistance rating of at least 3 hours. The remaining portions of the north wall are metal siding on unprotected steel. The building is bounded on the east by the Condensate Demineralizer Building area, which is separated from the Turbine Building by a 12-inch thick concrete block and reinforced concrete wall with a fire resistance rating of at least 3 hours with pyrocrete structural steel upgrades. The west wall, which joins the Service Building, is of 12-inch thick concrete block construction with a fire resistance rating of at least 3 hours and also contains pyrocrete structural steel upgrades. The building is bounded on the south by the Control Complex, Cable Tunnel, and the Intermediate Building. The Control Complex is separated from the Turbine Building by an 8-inch thick reinforced concrete block wall, with a fire resistance rating of 2 hours, and a metal barrier wall, except for the operating floor which is separated from the control room by an unrated metal pressure barrier wall and an additional glass panel wall and water curtain. The cable tunnel is separated from the Turbine Building by a reinforced concrete wall with a fire resistance rating of at least 3 hours. The intermediate building is separated from the Turbine Building by a 12-inch thick concrete block wall with a fire resistance rating of at least 3 hours.

The Turbine Oil Storage Building is a small building housing the turbine oil storage tank, transfer pumps, and related equipment. The building is also used for storage of bulk quantities of maintenance lubricants. The building is separated from the Hydrogen Storage Building to the west and Diesel Generator Building to the east by 12-inch reinforced concrete walls with a fire resistance rating exceeding three hours. The building is separated from the Turbine Building (to the south) by a 12-inch concrete block wall having a fire resistance rating of 3 hours. The roof is metal deck supported by unprotected steel. One door opening penetrates the fire barrier wall separating the Turbine Oil Storage Building from the Turbine Building. This opening is protected by a 3 hour rated door. The only other opening is a door and a large overhead door exposed to grade in the north wall.

The Turbine Building is separated from the Transformer yard general area by a non-rated metal siding wall, but a three hour rated masonary barrier wall is installed in the immediate area of the main transformer.

The Ginna Admin Building is a 2-story general business occupancy structure constructed from masonry and steel construction. The east wall of the building where it meets with the west wall of the service building is considered a 2-hour rated fire barrier due to the 8" block wall construction. The building is protected by a fully automatic sprinkler system and smoke and heat detection. Portable fire extinguishers are placed throughout the building. The exterior of the west of the building has a fire department connection for use by the off-site fire department apparatus.

## Condensate Demineralizer Building

**Fire Area BOP**

**Fire Zone AVT**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Condensate Demineralizer Mixed Bed DI Tanks A, B, C, and D, Sulfuric Acid Tank, Sodium Hydroxide Tank, and AVC-2 (480V panel).

### Fire Protection

Suppression System(s)

- No fixed suppression systems have been provided.
- Portable fire extinguishers are available in this area/zone.
- A hose station is available in this zone, adjacent fire zones and exterior yard hydrants are available for use if needed.

Detection System(s)

- No fixed detection systems have been provided.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated poured concrete on sheet metal deck to Technical Support Center (Fire Area BOP/Fire Zones TSC-1S, TSC-1M, and TSC-1N) |
| Floor: | Non-rated poured concrete to grade. |
| North Boundary: | Non-rated poured concrete to exterior. |
| South Boundary: | Non-rated poured concrete to grade. |
| East Boundary: | Non-rated poured concrete to grade.<br>Non-rated poured concrete to exterior. |

| Boundaries | |
|---|---|
| West Boundary: | 3 hour rated poured concrete and 12" thick hollow concrete block to the Turbine Building (Fire Area BOP/Fire Zone TB-l) |

Doors

- F27 - 3 hour rated fire door to Turbine Building (Fire Area BOP/Fire Zone TB-l)
- F28 - 3 hour rated fire door to Turbine Building (Fire Area BOP/Fire Zone TB-l)

Dampers

- TBE-24-l - 3 hour rated curtain type fire damper to Turbine Building (Fire Area BOP/Fire Zone TB-l)
- TBE-24-2 - 3 hour rated curtain type fire damper to Turbine Building (Fire Area BOP/Fire Zone TB-l)
- TBE-24-3 - 3 hour rated curtain type fire damper to Turbine Building (Fire Area BOP/Fire Zone TB-l)
- TBE-24-4 - 3 hour rated curtain type fire damper to Turbine Building (Fire Area BOP/Fire Zone TB-l)

Special Provisions

- None

**Combustible Loading**

Floor Area = 5,920 ft$^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/ft$^2$)
Major Combustibles: Cable Insulation, PVC, Rubber

**Potential Hazards**

- Chemical hazards such as Ammonium Hydroxide, Sulfuric Acid and Sodium Hydroxide.
- There are 480 volt motors throughout this zone.
- AVC-2 has 480 volts.
- Mixing of sulfuric acid and sodium hydroxide will cause an intense exothermic reaction.

**NRC Approval from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.

- DA-ME-92-101, Rev. 0, Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426, dated 2/28/92
- DA-ME-94-004, Rev. 0, dated 1/12/94, Evaluation of Fire Protection Hose Reel Coverage
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Hydrogen Storage Building

**Fire Area BOP**

**Fire Zone H2**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Various hydrogen and CO2 compressed gas cylinders for Turbine operations

### Fire Protection

Suppression System(s)

- No fixed suppression systems have been provided.
- Portable fire extinguishers are available in adjacent fire areas/zones.
- Hose stations are available in adjacent fire areas/zones or by exterior yard hydrants.

Detection System(s)

- No fixed detection systems have been provided.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated poured concrete to grade. |
| North Boundary: | Non-rated sheet metal siding to exterior (Fire Area YARD) |
| South Boundary: | 3 hour rated minimum 12" thick poured concrete to Turbine Building (Fire Area BOP/Fire Zone TB-1) |
| East Boundary: | 3 hour rated minimum 12" thick poured concrete to Turbine Oil Storage Building (Fire Area BOP/Fire Zone TO) |
| West Boundary: | Non-rated sheet metal siding to exterior. |

Doors

- None

Dampers

- None

Special Provisions

- Hydrants 12 and 13 can be used for manual fire fighting activities by using the hose in hose cabinet #4 as well as the Master Stream appliance.

**Combustible Loading**

Floor Area = 550 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Hydrogen

**Potential Hazards**

- Keep Hydrogen tanks cooled by dousing them with water. Should these tanks become hot, the safety valves will open releasing large amounts of highly explosive hydrogen gas into the building or may burn with a blow torch effect.
- Hydrogen is lighter than air and will rise, ensure adequate ventilation to remove gases from the building.
- There are two (2) 6000 gallon Diesel Fuel Tanks located under this building below grade.
- Various compressed gas CO2 cylinders.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2002-005, Primary and Secondary Hydrogen Storage Buildings NFPA 50A Code Review, Rev. 0, dated 2/25/02

## Service Building Basement

**Fire Area BOP**
**Fire Zone SB-1**
**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Domestic Hot Water Boiler, and MCC F.

### Fire Protection

Suppression System(s)

- S19 is an automatic sprinkler system that provides suppression protection in the zone.
- Portable fire extinguishers are available in this zone.
- A hose station is available in this zone as well as exterior yard hydrant connections.
- Building sprinkler system is also provided with a fire department connection.

Detection System(s)

- No fixed detection systems have been provided.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to the Service Building Office Level (Fire Area BOP/Fire Zone SB-2). |
| Floor: | Non-rated to grade. |
| North Boundary: | Non-rated to exterior. |
| South Boundary: | Non-rated to exterior. |

| Boundaries | |
|---|---|
| East Boundary: | 3 hour rated to Intermediate Building (Fire Area ABI/Fire Zone IBN-1).<br><br>3 hour rated to Turbine Building with pyrocrete upgrades (Fire Area BOP/Fire Zone TB-1)<br><br>3 hour rated to Turbine Building Feed Pump Room with pyrocrete upgrades (Fire Area BOP/Fire Zone TB-1FP) |
| West Boundary: | Non-rated to exterior. |

Doors

- F17 - 1 1/2 hour rated fire door in North Stair Tower.
- F18 - 1 1/2 hour rated fire door to North Stair Tower.
- F19 - 3 hour rated fire door in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-1).
- F20 - 3 hour rated rolling fire door in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-1).
- F605 - 1 1/2 hour rated fire door to center stair tower.

Dampers

- None

Special Provisions

- Wye connection is provided on North wall of building for Fire Department connection

**Combustible Loading**

Floor Area = 16,275 ft$^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/ft$^2$)
Major Combustibles: Files, Rubber, Cable Insulation, Plastic, Cardboard, Furniture, Wood

**Potential Hazards**

- Acetylene compressed gas cylinders in Machine and Welding Shops.
- A natural gas line is routed through the zone which can be isolated outdoors at valve 2160 which is located on the west side of the Service Building.
- Numerous flammable liquid storage cabinets within and outside of the stockroom area.
- Various other compressed gas cylinders.
- Chemicals such as sodium hydroxide and sulfuric acid.

**NRC Approval from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-106, Analysis of Steel Fire Protection and Fire Barriers, dated September 6, 1995
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Service Building Hot Shop

**Fire Area BOP**

**Fire Zone SB-1HS**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- S19 is an automatic sprinkler system that provides suppression protection in the zone.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in adjacent fire areas/zones as well as yard hydrant connections.

Detection System(s)

- No fixed detection systems have been provided.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Service Building Office Level (Fire Area BOP/Fire Zone SB-2) |
| Floor: | Non-rated to grade. |
| North Boundary: | Non-rated to Service Building Basement (Fire Area BOP/Fire Zone SB-l) |
| South Boundary: | Non-rated to Service Building Water Treating Area (Fire Area BOP/ Fire Zone SB-lWT) |
| East Boundary: | Three hour rated to Intermediate Building (Fire Area ABI/Fire Zones IBN-l and IBS-l) |
| West Boundary: | Non-rated to Service Building Basement (Fire Area BOP/Fire Zone SB-l) |

Doors

- F509 - 3 hour rated fire door in east wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-1)

Dampers

- None

Special Provisions

- Wye connection is provided on North wall of building for Fire Department connection

**Combustible Loading**

Floor Area = 1,460 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: Cable Insulation, Clothing, Rubber

**Potential Hazards**

- Acetylene, Hydrogen and flammable liquids are present in the zone.
- Various compressed gas cylinders.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/91.
- DA-ME-95-058, Rev. 0, Contaminated Storage Building and Hot Shop Sprinkler Systems Actuation Evaluation, dated 1/18/95
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Service Building Water Treatment Room

**Fire Area BOP**

**Fire Zone SB-1WT**

**Elevations 253'-6" & 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Condensate Storage Tank A/B (TCD02A/TCD02B).

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- S19 is an automatic sprinkler system that provides suppression protection for the zone.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in adjacent fire areas/zones as well as yard hydrant connections.

Detection System(s)

- No fixed detection systems have been provided.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Service Building Office Level (Fire Area BOP/Fire Zone SB-2)<br>Non-rated to exterior (at elevation 271'-0"). |
| Floor: | Non-rated to grade.<br>Non-rated to Service Building Basement (Fire Area BOP/Fire Zone SB-1) (at elevation 271'-0") |
| North Boundary: | Non-rated to Service Building Basement, Office Level and Hot Shop (Fire Area BOP/Fire Zones SB-1, SB-2 and SB-1HS) |
| South Boundary: | Non-rated to Service Building Office Level (Fire Area BOP/Fire Zone SB-2) |

| Boundaries | |
|---|---|
| East Boundary: | 3 hour rated to Intermediate Building (Fire Area ABI/Fire Zones IBS-1 and IBS-2)<br>3 hour rated to Spent Fuel Pool in Auxiliary Building (Fire Area ABI/ Fire Zone ABO)<br>3 hour rated to Auxiliary Building Operating Floor (Fire Area ABI/ Fire Zone ABO) |
| West Boundary: | Non-rated to exterior and Service Building Office Level (Fire Area BOP/Fire Zone SB-2) |

Doors

- None

Dampers

- I-27 - 3 hour rated curtain type fire damper to the Intermediate Building South elevation 253'-6" (Fire Area ABI/Fire Zone IBS-1)

Special Provisions

- Wye connection is provided on North wall of building for Fire Department connection

**Combustible Loading**

Floor Area = 4,183 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: Cable Insulation, plastics, fiberglass

**Potential Hazards**

- Sodium hydroxide storage tank and piping.
- A natural gas line is routed through the zone which can be isolated outdoors at valve 2160 which is located on the west side of the Service Building.
- Various compressed gas cylinders.

**NRC Approval from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/ 31/94
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Ginna Administrative Building

**Fire Area BOP**

**Fire Zone GAB**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- S40 is an Auto Sprinkler System for all floors and all rooms within the Ginna Admin Building.
- Portable Fire Extinguishers are located throughout the Fire Zone.
- HYD#7 is located to the North in the yard and can be used for suppression activities.
- Wall hydrant 5158 is located on the Northwest corner of the buildings exterior.
- S40C - Clean Agent Suppression System (NOVEC 1230) in the Document Storage Vault installed under TSR 2008-0052.

Detection System(s)

- Z45 provides heat and smoke detections throughout the fire zone and will activate horns and strobes if alarmed.
- Z45 signals on the guard house fire panel and locally at the fire system panels in the Ginna Admin Building.

### Design Features

The new Admin Building was constructed along the l-line wall adjacent to the Service Building. The Admin Building is of masonry and steel construction and was built to local, state and NFPA code requirements for general business occupancy with consideration for some use as a cafeteria. The Admin Building west wall and Service Building east wall provide a 2 hour rated fire barrier due to the 8" thick hollow concrete wall construction. Automatic suppression is provided for both the Admin and Service Buildings.

| Boundaries | |
|---|---|
| North Boudary: | Non-rated to exterior. |
| West Boundary: | Non-rated to exterior. |
| South Boundary: | Non-rated to exterior. |
| East Boundary | 2 hour rated 8" hollow block wall to Service Building (Fire Area BOP/Fire Zone SB-2) |
| Floor | Non-rated poured concrete to grade. |

Doors

- There is a 3 hour rated door installed in the Document Storage Vault
- There is a 4 hour rated vault installed in the Document Storage Vault.

Dampers

- Dampers VD-1 through VD-8 are installed in the supply and return air ducts in the Document Storage Vault.

**Combustible Loading**

Floor Area = 33,650 $ft^2$(total)
Equivalent Fire Severity Classification: MEDIUM (60,000 BTU/$ft^2$ to less than 120,000 BTU/$ft^2$)
Major Combustibles: Class A Material; Office Furniture and Supplies, Paper, Wood, Cardboard

**Engineering Evaluations**

- DA-ME-98-004, Rev. 4, Combustible Loading Analysis, dated 5/10/2006.

## Service Building Office Level

**Fire Area BOP**

**Fire Zone SB-2**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- S19 is an automatic sprinkler system that provides suppression protection for the zone.
- Portable fire extinguishers are available in this zone.
- A hose station is available in this zone as well as yard hydrant connections.
- Building Sprinkler System is provided with a fire department connection.

Detection System(s)

- No fixed detection systems have been provided in the zone.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to Service Building Basement, Hot Shop and Water Treating Area (Fire Area BOP/Fire Zones SB-l, SB-lHS, and SB-lWT) |
| North Boundary: | Non-rated to exterior. |
| South Boundary: | Non-rated to exterior. |
| East Boundary: | 3 hour rated to Intermediate Building (Fire Area ABI/Fire Zones IBN-l, IBN-2, IBS-2)<br>3 hour rated to Turbine Building with pyrocrete upgrades (Fire Area BOP/Fire Zone TB-2)<br>2 hour rated at Controlled Access Area (Fire Area ABI/Fire Zone IBS-2) |

| Boundaries | |
|---|---|
| West Boundary: | Non-rated to exterior. |

Doors

- F5 (active leaf) and F5-1 (inactive leaf) - 3 hour rated double fire door in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- F6 (active leaf) and F6-1 (inactive leaf) - 3 hour rated double fire door in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- F15 - 3 hour rated fire door in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- F16 - 1 1/2 hour rated fire door to North Stair Tower.
- F510 - 3 hour rated fire door in east wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- F604 - 1 1/2 hour rated fire door to center stair tower.
- S46F - 3 hour rated fire door in east wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- S65F - 3 hour rated fire door in east wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)

Dampers

- I-340-1 - 3 hour rated curtain type fire damper in east wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-340-2 - 3 hour rated curtain type fire damper in east wall to Intermediate Building (Fire Area ABI/Fire Zone IBS-2)
- I-350-1 - 1 1/2 hour rated curtain type fire damper in east wall to Intermediate Building (Fire Area ABI/Fire Zone IBN-2)
- I-350-2 - 1 1/2 hour rated curtain type fire damper in east wall to Intermediate Building (Fire Area ABI/Fire Zone IBN-2)
- TBW-2-1 - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- TBW-2-2 - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- TBW-2-3 - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- TBW-3 - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- TBW-3A - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)

- TBW-3B - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- TBW-3C - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- TBW-3D - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- TBW-3E - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- TBW-3F - 3 hour rated curtain type fire damper in east wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)

Special Provisions

- Fire dampers I-350-1 and I-350-2 are installed back-to-back and are maintained in closed position to provide a 3 hour combined rating. Refer to DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94 for the justification of this configuration.
- Fire Brigade dress out area and equipment storage is located in this fire zone adjacent to the controlled access area.
- Wye connection is provided on North wall of building for Fire Department connection

**Combustible Loading**

Floor Area = 25,075 $ft^2$
Equivalent Fire Severity Classification: MEDIUM (60,000 BTU/$ft^2$ to less than 120,000 BTU/$ft^2$)
Major Combustibles: Files, Cardboard, Carpet, Paper, Furniture

**Potential Hazards**

- Various compressed gas cylinders.
- Various chemicals located in the Chemistry Lab.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-106, Analysis of Steel Fire Protection and Fire Barriers, dated September 6, 1995
- DA-ME-93-042, Rev. 0, analysis of Replacement Fire Dampers for Penetrations TBW-2-P and TBW-3-P, dated 4/10/93
- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94

- DA-ME-93-119, Rev 0, Analysis of Replacement Fire Dampers for AH-44, BA-33 and BB-46, dated October 21, 1993.
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-94-004, Rev. 0, dated 1/12/94, Fire Protection Hose Reel Coverage.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Turbine Building Basement and GE Betz

**Fire Area BOP**

**Fire Zone TB-1**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Turbine Building (TB) DC distribution panel (DCPCPTB01B), TSC to Battery A/B throw over switch (DCPCPTB02), main condenser B hotwell makeup AOV (4315), TB misc 120V distribution panel B (ACPDPTB10), MCCA, SG condenser steam dump valves (3349, 3350, 3351, 3352, 3353, 3354, 3355, and 3356), SG A/B blowdown isolation AOV to blowdown tank (5709/5710), and Turbine Bldg Service Water isolation MOV (4613).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Fire Water Storage Tank and Booster Pump, Condensate Pumps A, B, and C, Heater Drain Tank Pumps A and B, Service Air Compressor, 1A compressors A, B, and C, Bus Duct Coolers, GE Betz Water Treatment System, and the Seal Oil Unit.

**Fire Protection**

Suppression System(s)

- S24 is a manual deluge suppression system which provides suppression protection for the Condenser Pit.
- S25 is an automatic deluge suppression system which provides suppression protection for the Seal Oil Unit.
- S26 is an automatic sprinkler system which provides suppression protection at the south end of the Condensers and around the Condensate Pumps.
- S27 is an automatic deluge suppression system which provides suppression protection around the Lube Oil Reservoir Area.
- S45 is an automatic sprinkler system which provides suppression protection for the GE Betz Water Treatment trailers and vestibule.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone as well as yard loop hydrant connections.

Detection System(s)

- S24 heat detectors provide annunciation of conditions in the Control Room. This will result in operator response and manual actuation of the deluge system either locally or from the control room.
- S25 heat detectors actuate suppression system S25.
- S27 heat detectors actuate suppression system S27.
- Z32 provides detection for the Turbine Building north area and the Feedwater Pump Room.
- Z33 provides detection for the Turbine Building south area.
- Z40 smoke detectors provide detection for the Condensate Booster Pump area.

## Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Turbine Building Elevation 271'-0" (Fire Area BOP/Fire Zone TB-2) |
| Floor: | Non-rated reinforced poured concrete to grade. |
| North Boundary: | 3 hour rated to the Hydrogen Storage Building (Fire Area BOP/Fire Zone H2)<br>3 hour rated to the Turbine Oil Storage Building (Fire Area BOP/Fire Zone TO)<br>3 hour rated to Diesel Generator A Room (Fire Area EDG1A)<br>3 hour rated to Diesel Generator B Room (Fire Area EDG1B)<br>Non-rated glass, metal siding, concrete block and poured concrete to exterior between column lines 3 and 9).<br>Non-rated unprotected opening to GE Betz Trailers |
| South Boundary: | 2 hour rated to Battery Room 1A (Fire Area BR1A)<br>2 hour rated to Battery Room 1B (Fire Area BR1B)<br>2 hour rated to the Control Building Air Handling Room (Fire Area CC/Fire Zone AHR)<br>3 hour rated to the Intermediate Building clean side with pyrocrete upgrades (Fire Area ABI/Fire Zone IBN-1)<br>3 hour rated 12" thick hollow concrete block and 12" thick poured reinforced concrete to the Cable Tunnel (Fire Area CT).<br>3 hour rated 12" thick hollow concrete block to elevator shaft and stairwell areas for property conservation purposes. |
| East Boundary: | 3 hour rated to Condensate Demineralizer Building (Fire Area BOP/ Fire Zone AVT) |

| Boundaries | |
|---|---|
| West Boundary: | 3 hour rated 12" thick hollow concrete block to Service Building with pyrocrete upgrades (Fire Area BOP/Fire Zone SB-1) |

Doors

- F19 - 3 hour rated fire door in west wall to Service Building (Fire Area BOP/Fire Zone SB-1)
- F20 - 3 hour rated rolling fire door in west wall to Service Building (Fire Area BOP/Fire Zone SB-1)
- F21 - 3 hour rated rolling fire door to Hydrogen Seal Oil Unit Enclosure.
- F21A - 1 1/2 hour rated fire door to Hydrogen Seal Oil Unit Enclosure.
- F21B - 1 1/2 hour rated fire door to Hydrogen Seal Oil Unit Enclosure.
- F21C - 1 1/2 hour rated fire door used for damper access in Hydrogen Seal Oil Unit Enclosure.
- F22 - 1 1/2 hour rated fire door to Hydrogen Seal Oil Unit Enclosure.
- F23 - 3 hour rated rolling fire door to Hydrogen Seal Oil Unit Enclosure.
- F24 (active leaf) and F24-1 (inactive leaf) - 3 hour rated double fire door in south wall to Air Handling Room (Fire Area CC/Fire Zone AHR).
- F25 - 3 hour rated fire door in south wall to Battery Room 1A (Fire Area BR1A)
- F26 - 3 hour rated fire door in south wall to Battery Room 1B (Fire Area BR1B)
- F27 - 3 hour rated fire door in east wall to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT)
- F28 - 3 hour rated fire door in east wall to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT)
- F29 (active leaf) and F29-1 (inactive leaf) - 3 hour rated double fire door in north wall to Diesel Generator Room B (Fire Area EDG1B).
- F30 (active leaf) and F30-1 (inactive leaf) - 3 hour rated double fire door in north wall to Diesel Generator Room A (Fire Area EDG1A).
- F31 (active leaf) and F31-1 (inactive leaf) - 3 hour rated double fire door in north wall to Turbine Oil Storage Building (Fire Area BOP/Fire Zone TO).
- F36 - 3 hour rated rolling fire door in south wall to Intermediate Building (Fire Area ABI/ Fire Zone IBN-1)
- F500 - 3 hour rated fire door to South West Stair Tower.
- S37F (active leaf) and S37F-1 (inactive leaf) - 3 hour rated double fire door in south wall to Intermediate Building (Fire Area ABI/ Fire Zone IBN-1).

Dampers

- AH-39 - 1 1/2 hour curtain type fire damper in south wall to Air Handling Room (Fire Area CC/Fire Zone AHR)
- AH-44 - 1 1/2 hour curtain type fire damper in south wall to Air Handling Room (Fire Area CC/Fire Zone AHR)
- AH-53 - 1 1/2 hour curtain type fire damper in south wall to Air Handling Room (Fire Area CC/Fire Zone AHR)
- BA-28 - 1 1/2 hour curtain type fire damper in south wall to Battery Room 1A (Fire Area BR1A)
- BB-37 - 1 1/2 hour curtain type fire damper in south wall to Battery Room 1B (Fire Area BR1B)
- TBE-24-1 - 3 hour rated curtain type fire damper in east wall to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT)
- TBE-24-2 - 3 hour rated curtain type fire damper in east wall to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT)
- TBE-24-3 - 3 hour rated curtain type fire damper in east wall to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT)
- TBE-24-4 - 3 hour rated curtain type fire damper in east wall to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT)

Special Provisions

- Pyrocreted structural steel in area of Turbine Lube Oil Reservoir.
- Diked area around the Turbine Lube Oil Reservoir and oil collection transfer pumps to this reservoir from the seal oil unit enclosure.
- The Hydrogen Seal Oil Unit Enclosure is located in this fire zone at approximately column lines D and 10 and consists of walls and ceiling constructed of sheet metal studs and fire rated drywall covering materials to provide the structure with an overall one (1) hour fire rating. The floor is non-rated to grade. The overhead doors in the enclosure are fusible link operated rolling fire doors as noted below.
- A trench surrounds the Hydrogen Seal Oil Unit and contains drains that control flammable liquid spills from impacting adjacent areas.
- Foam cart plus 15 gallons of foam and a high rise pack are located next to the elevator.
- 150 pound wheeled dry chemical extinguishers are located on this floor.
- The drain box in the West Condenser pit area is provided with backflow prevention capability. (Refer to EWR 2720)

**Combustible Loading**

Floor Area = 30,370 $ft^2$
Equivalent Fire Severity Classification: MEDIUM (60,000 BTU/$ft^2$ to less than 120,000 BTU/$ft^2$)
Major Combustibles: Lube Oil, Cable Insulation, Powder Resin

**Potential Hazards**

- Feedwater Pump A and B and the power supplies to the motors are 4 kv.
- An oil fire could develop if oil leaks from either of the Feedwater Pumps.
- MCC A is a 480 volt distribution center.
- Condensate Pumps, motors and cables to these motors are 4 kv.
- An oil fire could develop if oil leaks from the Hydrogen Seal Oil Unit or the Condensate Pumps. For oil leaks in the Hydrogen Seal Oil Unit there are two sump pumps which will pump the oil to the Turbine Lube Oil Reservoir.
- Hydrogen leaks may develop in the area from the seal oil unit to the Hydrogen Storage Room.
- An oil fire could develop if oil leaks around the Heater Drain Tank Pumps, Air Compressors and Condensate Booster Pumps.
- The Heater Drain Tank Pumps, Air Compressors and Condensate Booster Pumps all have 4 kv motors.
- An oil fire could develop if oil leaks from Turbine Lube Oil Reservoir. This area is diked to control the oil spill. There is a lube oil line from the Lube Oil Reservoir to the Oil Storage Room. This line is not under pressure but is overhead and travels east and west at the north end of Turbine Building basement.
- Ammonia Injection Pumps could become a health hazard.
- ETA Tanks by the Lube Oil Purifier.
- Various compressed gas cylinders including Hydrogen.
- Various chemicals such as Ammonium Hydroxide and Monoethanolamine (ETA).

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- ME-91-0020, Rev. 0, Analysis of Penetrations AH-45-P and AH-9A-P, dated 5/20/91
- ME -91-0022, Rev. 1, Analysis of Penetrations of A & B Battery Rooms NCR 91-410, dated 7/31/91
- DA-ME-92-024, Rev. 0, Pipe Stress Analysis for Fire Protection Pipe in the Turbine Building, dated 7/10/92
- DA-ME-92-101, Rev. 0, Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426, dated 2/28/92

- DA-ME-92-106, Analysis of Steel Fire Protection and Fire Barriers, dated 9/6/95
- DA-CE-93-081, Turbine Building Pressure Wall Seals, dated 1/26/94.
- DA-ME-93-119, Rev. 0, Analysis of Replacement Fire Dampers for AH-44, BA-33 and BB-46, dated 10/21/93
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-94-015, Rev. 0, Turbine Building Smoke Removal Capability, dated 2/8/94
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Turbine Building Feedpump Room

**Fire Area BOP**
**Fire Zone TB-1FP**
**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Main Feedwater Pump A/B (PFW01A/PFW01B)

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Fire Water Booster Pump

### Fire Protection

Suppression System(s)

- No fixed suppression systems have been provided in the zone.
- Portable fire extinguishers are available in adjacent fire areas/zones.
- Hose stations are available in adjacent fire areas/zones.

Detection System(s)

- Z32 smoke detectors provide detection in the zone.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Turbine Building Elevation 271'-0" (Fire Area BOP/Fire Zone TB-2) |
| Floor: | Non-rated to grade. |
| North Boundary: | Non-rated to exterior. |
| South Boundary: | Non-rated to Turbine Building elevation 253'-6" (Fire Area BOP/Fire Zone TB-1) |
| East Boundary: | Non-rated to Turbine Building elevation 253'-6" (Fire Area BOP/Fire Zone TB-1) |
| West Boundary: | 3 hour rated to Service Building (Fire Area BOP/Fire Zone SB-1) with pyrocrete structural steel upgrades. |

Doors

- None

Dampers

- None

Special Provisions

- None

**Combustible Loading**

Floor Area = 2,060 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: Lube Oil, Solvent, Cable Insulation, PVC

**Potential Hazards**

- Feedwater pumps A & B are 4kv power supplies.
- An oil fire could develop if oil leaks from either of the feedwater pumps.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-024, Rev. 0, Pipe Stress Analysis for Fire Protection Pipe in the Turbine Building, dated 7/10/92
- DA-ME-92-106, Analysis of Steel Fire Protection and Fire Barriers, dated September 6, 1995
- DA-ME-94-015, Rev. 0, Turbine Building Smoke Removal Capability, dated 2/8/94
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Turbine Building Intermediate Floor

**Fire Area BOP**

**Fire Zone TB-2**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

BUS13, BUS15, BUS11A, BUS11B, BUS12A, BUS12B, Breaker for BUS13 (52/13), Breaker for BUS15 (52/15), MCCB, Breaker for BUS11A (52/11A), Breaker for BUS11B (52/11B), Breaker for BUS11A supply from BUS12A (52/BTA-A), Tie-breaker for BUS11A/11B (52/BTA-B), Breaker for BUS11B supply from BUS12B (52/BTB-B), MFW pump A/B discharge MOVs (3977/3976), MFW flow control valves to SG A/B (4269/4270), MFW flow control valve bypass valves (4271 and 4272), Breaker for MFW Pump A (52/FWP1A), Breaker for MFW Pump B (52/FWP1B), Main Steam control AOV to MSR 1A/1B/2A/2B (3425/3426/3427/3428), Moisture Separator Reheater 1A/1B/2A/2B mini warm up AOV (3425A/3426A/3427A/3428A), Turbine Building Misc 120V distribution panel (ACPDPTB07), breaker for MO/EF1A Aux Bldg Exhaust Fan A and B motors (52/EF1A and 52/EF1B), Turbine 1st stage pressure transmitters (PT-485 and PT-486), breaker for Condensate Pump A/B/C (52/CP1A, 52/CP1B, 52/CP1C), and breaker for Circulating Water Pump A and B (52/CWP1A and 52/CWP1B), breaker for heater drain tank pump A and B (52/HDP1A and 52/HDP1B).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Main condenser A and B, Feedwater heaters 5A and 5B, Condensate heaters 4A and 4B, Turbine emergency DC lube oil pump, Turbine lube oil reservoir vapor extractor A and B, and High pressure seal oil backup pump.

### Fire Protection

Suppression System(s)

- S38 is an automatic sprinkler system which provides suppression for various east end offices.
- S26 is an automatic sprinkler system which provides suppression for the turbine island area.
- S27 is an automatic deluge suppression system which provides protection for the turbine lube oil area.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.

Detection System(s)

- S27 heat detectors actuate suppression system S27.
- Z34 smoke detectors provide detection for the eastern section of the Turbine Building Intermediate level.
- Z41 smoke detectors provide area detection for the Switchgear area.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Turbine Building Operating Floor (Fire Area BOP/Fire Zone TB-3) |
| Floor: | Non-rated to Turbine Building Basement (Fire Area BOP/Fire Zone TB-1) |
| North Boundary: | 3 hour rated to the Oil Storage Room (Fire Area BOP/Fire Zone TO)<br>3 hour rated 12" thick poured reinforced concrete to Diesel Generator 1A (Fire Area EDG1A)<br>3 hour rated 12" thick poured reinforced concrete to Diesel Generator 1B (Fire Area EDG1B)<br>Non-rated metal siding and glass barrier to exterior (between column lines 3 and 9) |
| South Boundary: | 3 hour rated to the Intermediate Building (Fire Area ABI/Fire Zone IBN-1 and IBN-2) Portions of wall are covered with ¼" steel plant on the IB side of wall<br>2 hour rated to the Relay Room (Fire Area CC/Fire Zone RR) on the Turbine Building side. Also provided with metal steam line break barrier wall to shield block wall.<br>Non-rated metal/glass and metal siding to exterior transformer area (Fire Area YARD)<br>3 hour rated masonary barrier wall in the immediate area of the main transformer for property conservation purposes<br>3 hour rated 12" thick hollow concrete block to elevator shaft and stairwell areas for property conservation purposes |
| East Boundary: | 3 hour rated to the Technical Support Center with pyrocrete upgrades (Fire Area BOP/Fire Zones TSC-1S, TSC-1M, and TSC-1N) |
| West Boundary: | 3 hour rated to the Service Building with pyrocrete upgrades (Fire Area BOP/Fire Zone SB-2) |

Doors

- F5 (active leaf) and F5-1 (inactive leaf) - 3 hour rated double fire door in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- F6 (active leaf) and F6-1 (inactive leaf) - 3 hour rated double fire door in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- F7 - 3 hour rated fire door in east wall to Technical Support Center South Corridor (Fire Area BOP/Fire Zone TSC-1S)
- F14 - 3 hour rated fire door in east wall to Technical Support Center (Fire Area BOP/Fire Zone TSC-1M)

- F15 - 3 hour rated fire door in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- F501 - 3 hour rated fire door to South West Stair Tower.
- F504 (active leaf) and F504-1 (inactive leaf) - 3 hour rated double fire door in south wall to Relay Room (Fire Area CC/Fire Zone RR)
- S44F - 3 hour rated fire door in south wall to Intermediate Building (Fire Area ABI/Fire Zone IBN-2)

Dampers

- TBW-2-1 - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-2-2 - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-2-3 - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-3 - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-3A - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-3B - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-3C - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-3D - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-3E - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)
- TBW-3F - 3 hour rated curtain type fire damper in west wall to Service Building (Fire Area BOP/Fire Zone SB-2)

Special Provisions

- Design Analysis DA-ME-94-015 determined the Turbine Building ventilation system itself is not capable of removing smoke that would be typically generated by a lube oil fire. Ventilation can be controlled by manipulating the rolling fire doors and louvered windows and by using portable smoke ejectors.
- A dike surrounds the Turbine Oil Reservoir and will prevent the spread of flammable liquid to adjacent areas. In addition, structural steel in this area was coated to prevent failure resulting from fire.
- Guard piping on the main turbine bearing oil pipes will function to control oil spills in the Turbine Building.

## Combustible Loading

Floor Area = 32,055 ft$^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/ft$^2$)
Major Combustibles: Cable Insulation, Files, Wood, Office Contents, Office Structures, Rubber

## Potential Hazards

- An oil fire could develop if the lube oil line ruptures. The Turbine oil trip switch and the Turbine oil lockout switch can be opened but oil flow will not stop until the Shaft Driven Turbine Oil pump slows down.
- Hydrogen manifold and lines located under the Generator. Hydrogen can be isolated either locally or at the Secondary Hydrogen Bottle house before extinguishment can commence.
- Bus 11A, 11B, 12A, and 12B are 4KV and the Generator Bus ducts.
- Bus 13 and 15 have 4KV/480 volt transformers located on the north end and 480 volt on the south end.
- MCC B is a 480 volt distribution center.
- Relief valves on Halon tanks may lift if the tanks become too hot.
- Chemical addition area (various chemicals) (including Hydrazine).
- Various compressed gas cylinders (including Hydrogen).
- Main transformer exposure on south wall.

## NRC Approvals from NFPA 805 Chapter 3 Requirements

- None

## Engineering Evaluations

- DA-ME-92-024, Rev. 0, Pipe Stress Analysis for Fire Protection Pipe in the Turbine Building, dated 7/10/92
- DA-ME-92-101, Rev. 0, Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426, dated 2/28/92
- DA-ME-92-106, Analysis of Steel Fire Protection and Fire Barriers, dated September 6, 1995
- DA-ME-93-042, Rev. 0, analysis of Replacement Fire Dampers for Penetrations TBW-2-P and TBW-3-P, dated 4/10/93
- DA-CE-93-081, Turbine Building Pressure Wall Seals, dated 1/26/94.
- DA-ME-94-015, Rev. 0, Turbine Building Smoke Removal Capability, dated 2/8/94
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95

- DA-ME-94-118-08, Rev 0, Fire Barrier Penetration Seal Qualification Analysis for Snubber Detail (PENQ-08), dated 1/13/95.
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Turbine Building Operating Floor

**Fire Area BOP**

**Fire Zone TB-3**

**Elevation 289'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Turbine auto stop trip solenoid (20/AST), High Pressure (HP) Turbine E/H Governor valves (3462, 3463, 3464, and 3465), HP Turbine Main Steam stop valves (3544 and 3545), and Turbine Emergency Trip SOV (5501S3).

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** High Pressure Turbine, Low Pressure Turbines A and B, Generator, Generator Exciter, Emergency Ventilation Equipment Locker for the Control Room

### Fire Protection

Suppression System(s)

- S29 is an automatic deluge spray system which provides a water curtain on the pressure wall between the Operating Floor and the Control Room.
- Sprinkler protection is provided for the R-Shift office area.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.
- Dry Chemical extinguisher connections and 300 pound wheeled dry chemical units are provided for the turbine bearings.

**Note:** S29 is supplied by 2 supplies; V-9274 (normally open and operated by S29 heat detectors) and V-9275 (normally closed) (Ref. 33013-1988) and manually operable via the TSC south corridor.

Detection System(s)

- S29 heat detectors actuate suppression system S29.
- No fixed detection systems have been provided for the Operating Floor other than those which actuate suppression system S29.

## Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to Turbine Building Intermediate Floor (Fire Area BOP/ Fire Zone TB-2) |
| North Boundary: | Non-rated glass/metal and metal siding to exterior. |
| South Boundary: | Non-rated metal material barrier to the Control Room (Fire Area CC/ Fire Zone CR) provided with a deluge sprinkler system to provide adequate separation.<br>3 hour rated 12" thick hollow concrete block to Intermediate Building (Fire Area ABI/Fire Zones IBN-2, IBN-3, IBN-4) Portions of wall are covered with ¼" steel plant on the IB side of wall<br>Non-rated to exterior.<br>3 hour rated 12" thick hollow concrete block to elevator shaft and stairwell areas for property conservation purposes |
| East Boundary: | Non-rated glass/metal and metal siding to exterior. |
| West Boundary: | 3 hour rated 12" thick hollow concrete block to exterior.<br>Non-rated glass/metal and metal siding to exterior. |

Doors

- F505 - 3 hour rated fire door to South West Stair Tower.
- F506 - 3 hour rated fire door from South West Stair Tower to Catwalk for Bridge Crane.
- F600 - 3 hour rated fire door from South West Stair Tower to Elevator Equipment Room.
- S51F (active leaf) and S51F-1 (inactive leaf) - Non-rated double door (security provisioned) in south wall to Control Room (Fire Area CC/Fire Zone CR)

Dampers

- None

Special Provisions

- Design Analysis DA-ME-94-015 determined the Turbine Building ventilation system itself is not capable of removing smoke that would be typically generated by a lube oil fire. Ventilation can be controlled by manipulating the rolling doors and louvered windows and by using portable smoke ejectors.
- Foam cart with 15 gallons of foam can be used for oil fires.
- If the fire is around the bearings from bearing oil or other sources, connect one or both ansul units to the dry chemical input ports and open the bottle valve to pressurize the units and then open the nozzles.

## Combustible Loading

Floor Area = 32,065 $ft^2$

Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Files, R-Shift Office Area (desks, carpet, wood)

## Potential Hazards

- The generator/stator structure is cooled with hydrogen which is potentially flammable and explosive if mixed with sufficient oxygen. Hydrogen can be isolated either locally on the Intermediate level or in the Secondary Hydrogen Bottle House before extinguishing the fire.
- The overhead crane has 34 gallons of oil which presents a fire hazard.
- Various compressed gas cylinders.

## NRC Approvals from NFPA 805 Chapter 3 Requirements

- For the use of existing installed non-plenum listed cables routed above the Turbine Building Operating level conference room (NFPA 805 Chapter 3, section 3.3.5.1)

## Engineering Evaluations

- DA-ME-92-024, Rev. 0, Pipe Stress Analysis for Fire Protection Pipe in the Turbine Building, dated 7/10/92
- DA-CE-93-081, Turbine Building Pressure Wall Seals, dated 1/26/94.
- DA-ME-94-015, Rev. 0, Turbine Building Smoke Removal Capability, dated 2/8/94
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- GC5190, Heat Transfer Analysis During a Turbine Building Fire, dated 7/25/78
- EWR-1833-CALC-1, Water Curtain Deluge System, Heat Transfer Analysis and Temperature Detector Response to a Turbine Building Fire, dated 3/12/81
- EWR-1833-CALC-2, Temperature Detector Response to a Turbine Building Fire, dated 9/9/80
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Turbine Oil Storage Building

**Fire Area BOP**

**Fire Zone TO**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Two 6,250 gallon oil storage tanks and miscellaneous combustible liquid storage.

### Fire Protection

Suppression System(s)

- S16 is an automatic deluge suppression system which provides suppression for the Oil Storage Room.
- Portable fire extinguishers are available in this area/zone.
- Hose stations are available in adjacent fire areas/zones as well as exterior yard hydrant lines.

Detection System(s)

- S16 protomatic line type detectors actuate suppression system S16.
- No fixed detection systems have been provided other than those which actuate suppression system S16.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to grade. |
| North Boundary: | Non-rated to exterior. |
| South Boundary: | 3 hour rated 12" concrete block to Turbine Building (Fire Area BOP/ Fire Zone TB-1) |
| East Boundary: | 3 hour rated 12" thick poured reinforced concrete to Diesel Generator A room (Fire Area EDG1A) |

| Boundaries | |
|---|---|
| West Boundary: | 3 hour rated to Hydrogen Storage Building (Fire Area BOP/Fire Zone H2) |

Doors

- Fire doors F31 (active leaf) and F31-1 (inactive leaf) - 3 hour rated double fire door in south wall to Turbine Building (Fire Area BOP/Fire Zone TB-1).

Dampers

- None

Special Provisions

- The area surrounding the storage tank is provided with a dike to contain spills.
- Foam cart plus 15 gallons of foam and a Hi-Rise pack are located in the Turbine Building basement.

**Combustible Loading**

Floor Area = 1,760 ft$^2$
Equivalent Fire Severity Classification: HIGH (> 120,000 BTU/ft$^2$)
Major Combustibles: Lube Oil, Miscellaneous Lubricants

**Potential Hazards**

- Flame impingement on storage containers, flammable liquid storage lockers, and drums could cause container failures. Water streams can be utilized to minimize exposure hazards.
- An oil fire could develop if oil leaks from the Turbine Lube Oil Storage Tank. This area is diked to control the oil spill.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

# Technical Support Center
# (Mechanical Equipment Room and Administrative Computer Room)

**Fire Area BOP**

**Fire Zone TSC-1M**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** TSC HVAC equipment

## Fire Protection

Suppression System(s)

- S31 is an automatic deluge suppression system which provides suppression protection for the charcoal filter.
- S33 is an automatic sprinkler system which provides suppression and flow alarm for the TSC hose reels.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in adjacent zones.

Detection System(s)

- S34D1 smoke detectors provide HVAC disconnect in the administration computer room.
- S34D2 smoke detectors provide computer disconnect in the administration computer room.
- Z29 smoke detectors provide detection for the TSC equipment room and the TSC north corridor.
- S31 heat detectors provide automatic actuation of system S31.
- S33 smoke detectors provide detection capability and disconnect for the TSC HVAC system.

## Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated 12" thick minimum poured concrete to exterior. |

| Boundaries | |
|---|---|
| Floor: | Non-rated 12" thick minimum poured concrete to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT) |
| North Boundary: | Non-rated 12" A thick minimum poured concrete to exterior. |
| South Boundary: | 3 hour 12" hollow concrete block to Technical Support Center (Fire Area BOP/Fire Zone TSC-1N) to comply with building code considerations.<br>Non-rated where Admin Computer Room interfaces with TSC-1N. |
| East Boundary: | Non-rated to exterior. |
| West Boundary: | 3 hour 12" hollow concrete block to Turbine Building (Fire Area BOP/Fire Zone TB-2) with pyrocrete structural steel upgrading. |

Doors

- F13 - 3 hour rated fire door from TSC Mechanical Equipment Room to TSC Office Area (Fire Area BOP/Fire Zone TSC-1N).
- F13A (active leaf ) and F13A-1 (inactive leaf) - 3 hour rated double fire door from TSC area to TSC Mechanical Equipment Room.
- F14 - 3 hour rated fire door from TSC Mechanical Equipment Room to the Turbine Building (Fire Area BOP/Fire Zone TB-2)

Dampers

- TSCMR-60 - Non-rated curtain type damper from TSC Mechanical Equipment Room to TSC Office Area (Fire Area BOP/Fire Zone TSC-1N)
- TSCMR-90 - Non-rated curtain type damper from TSC Mechanical Equipment Room to TSC Office Area (Fire Area BOP/Fire Zone TSC-1N)
- TSCMR-165 - 3 hour rated curtain type fire damper between Admin Office Area and TSC Mechanical Equipment Room
- TSCMR-166 - 3 hour rated curtain type fire damper between Admin Office Area and TSC Mechanical Equipment Room

Special Provisions

- None

**Combustible Loading**

Floor Area = 3,840 ft$^2$
Equivalent Fire Severity Classification: MEDIUM (60,000 BTU/ft$^2$ to less than 120,000 BTU/ft$^2$)
Major Combustibles: Cardboard, Carpet, Files, Charcoal, Furniture, Plastic

**Potential Hazards**

- TSC Charcoal Filter Unit fan filters

**NRC Approval from NFPA 805 Chapter 3 Requirements**

- For the use of existing installed non-plenum listed cables routed above the TSC and adjoining hallway (NFPA 805 Chapter 3, section 3.3.5.1)

**Engineering Evaluations**

- DA-ME-92-106, Analysis of Steel Fire Protection and Fire Barriers, dated September 6, 1995
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Technical Support Center

**Fire Area BOP**

**Fire Zone TSC-1N**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** SAS/PPCS Computers

### Fire Protection

Suppression System(s)

- S30 is an automatic sprinkler system which provides suppression for the TSC Diesel Generator Room and the Operational Support Center
- S33 is an automatic sprinkler system which provides suppression and flow alarm for the TSC hose reels.
- S37 is an automatic halon suppression system which provides suppression protection for the SAS/PPCS computer room and subfloor.
- Portable fire extinguishers are available in this zone.
- Hose stations are available in this zone.

Detection System(s)

- Z39 smoke detectors provided detection of the area below the raised floor of the TSC.
- S37 smoke detectors actuate suppression system S37.
- Z28 smoke detectors provide detection for the TSC Main Office Area and SAS/PPCS Computer Room.
- Z31 smoke and heat detectors provide detection for the TSC South Office Areas.
- S33 smoke detectors provide detection capability and disconnect for the TSC HVAC system.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated 12" thick minimum poured concrete to exterior. |
| Floor: | Non-rated 12" thick minimum poured concrete to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT) |
| North Boundary: | 3 hour rated 12" thick hollow concrete block to Technical Support Center Mechanical Equipment Room (Fire Area TSC/Fire Zone TSC-1M) to comply with building code considerations. |
| South Boundary: | Non-rated to Technical Support Center south corridor (Fire Area BOP/Fire Zone TSC-1S) |
| East Boundary: | Non-rated 12" thick poured concrete to exterior. |
| West Boundary: | 3 hour rated poured concrete and 12" thick hollow concrete block to the Turbine Building (Fire Area BOP/Fire Zone TB-2) |

Doors

- F12 - 3 hour rated fire door from TSC Office Area to TSC south hallway (Fire Area BOP/Fire Zone TSC-1S).
- F13 - 3 hour rated fire door from TSC Office Area to TSC Mechanical Equipment Room area (Fire Area BOP/Fire Zone TSC-1M).
- F32 - 3/4 hour rated fire door to SAS/PPCS Computer Room
- F33 - 3/4 hour rated fire door to SAS/PPCS Computer Room

Dampers

- SAS-190 - 3 hour rated curtain type fire damper from SAS/PPCS Computer Room to TSC Office Area
- SAS-192 - 3 hour rated curtain type fire damper from SAS/PPCS Computer Room to TSC Office Area
- TSCMR-60 - Non-rated curtain type damper from TSC Office Area to TSC Mechanical Equipment Room (Fire Area BOP/Fire Zone TSC-1M)
- TSCMR-90 - Non-rated curtain type damper from TSC Office Area to TSC Mechanical Equipment Room (Fire Area BOP/Fire Zone TSC-1M)
- TSCSC-360 - Non-rated damper from TSC Office Area to South Corridor (Fire Area BOP/Fire Zone TSC-1S)

Special Provisions

- None

**Combustible Loading**

Floor Area = 1,750 $ft^2$
Equivalent Fire Severity Classification: HIGH (>120,000 BTU/$ft^2$)
Major Combustibles: Desks, Plastic, Carpet, Tile Flooring

**Potential Hazards**

- None

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Technical Support Center (South of Corridor)

**Fire Area BOP**

**Fire Zone TSC-1S**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

TSC Battery (BTRYTSC), TSC to Battery A & B DISC switch (DCPCPCD01), TSC Battery DC fused disconnect switch (DCPDPCD02), TSC Auto transfer switch (83/TSC), TSC distribution panels (ACPDPCD02 and ACPCPCD04), TSC Battery Charger (BYCTSC), TSC Emergency Diesel Generator (KED03), and TSC DG room inlet dampers (AED23 and AED24).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

**Fire Protection**

Suppression System(s)

- S30 is an automatic sprinkler system which provides suppression coverage for the TSC Diesel Generator Room and Operational Support Center.
- Portable fire extinguishers are available in this zone and in adjacent fire areas/zones.
- Hose stations are available in adjacent fire areas/zones.
- S33 provides a flow alarm for the TSC hose reels which are located in the adjacent TSC fire zone.

Detection System(s)

- Z27 smoke detectors provide detection for the TSC South Corridor.
- Z30 smoke and heat detectors provide detection system coverage for the TSC Diesel Generator, Inverter, Battery Rooms and South Corridor.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated 12" thick minimum poured concrete to exterior. |

| Boundaries | |
|---|---|
| Floor: | Non-rated 12" thick minimum poured concrete to Condensate Demineralizer Building (Fire Area BOP/Fire Zone AVT) |
| North Boundary: | Non-rated 12" thick minimum poured concrete to Technical Support Center (Fire Area BOP/Fire Zone TSC-1N). |
| South Boundary: | 3 hour rated 12" thick poured concrete to exterior exposure hazards.<br>3 hour rated to Relay Room Annex (Fire Area CC/Fire Zone RR). |
| East Boundary: | 3 hour rated to exterior exposure hazards. |
| West Boundary: | 3 hour rated poured concrete and 12" thick hollow concrete block to the Turbine Building (Fire Area BOP/Fire Zone TB-2) with pyrocrete structural steel upgrading.<br>3 hour rated to Relay Room (Fire Area CC/Fire Zone RR). |
| Interior Walls: | 3 hour rated 12" minimum poured concrete for property conservation purposes. |

Doors

- F7 - 3 hour rated fire door from TSC to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- F8 - 3 hour rated fire door from TSC south hallway to TSC Battery Room.
- F9 - 3 hour rated fire door from TSC south hallway to TSC Inverter Room.
- F10 - 3 hour rated fire door from TSC south hallway to TSC Diesel Generator Room.
- F11 - 3 hour rated fire door from TSC south hallway to exterior.
- F12 - 3 hour rated fire door from TSC south hallway to TSC Office Area (Fire Area BOP/Fire Zone TSC-1N).

Dampers

- TSCD-19 - Non-rated damper from TSC Diesel Generator to South Corridor
- TSCD-22 - 3 hour rated curtain type fire damper from TSC Diesel Generator Room to TSC Inverter Room
- TSCD-24 - 3 hour rated curtain type fire damper from TSC Diesel Generator Room to TSC Inverter Room
- TSCI-1 - 3 hour rated curtain type fire damper from TSC Inverter Room to South Corridor
- TSCI-2 - 3 hour rated curtain type fire damper from TSC Inverter Room to South Corridor
- TSCI-12 - 3 hour rated curtain type fire damper from TSC Inverter Room to TSC Battery Room
- TSCI-13 - 3 hour rated curtain type fire damper from TSC Inverter Room to TSC Battery Room
- TSCSC-360 - Non-rated damper from TSC South Corridor to TSC Office Area (Fire Area BOP/Fire Zone TSC-1N)

Special Provisions

- None

**Combustible Loading**

Floor Area = 1,000 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: Diesel Fuel, Lube Oil, Cable Insulation, Battery Cases

**Potential Hazards**

- TSC Day Tank supplied by underground 2000 gallon TSC Diesel Generator Fuel Oil Storage tank
- TSC Batteries and sulfuric acid

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-106, Analysis of Steel Fire Protection and Fire Barriers, dated September 6, 1995
- DA-ME-98-083, Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP, dated 6/4/99.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## 7.4 Fire Area BR1A

This room is separated from adjacent zones and fire areas by 8" reinforced concrete block walls with a 3 hour rated door to the Turbine Building and a 1 1/2 hour rated door to Battery Room 1B. Ventilation openings to the Turbine Building, Air Handling Room and Battery Room 1B are protected with fire rated dampers. Ceiling structural steel is provided with fire proofing materials which provides a one hour rating.

## Battery Room 1A

**Fire Area BR1A**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Battery A (BTRYA), Battery A Main Disconnect (DCPDPCB01A), Battery A Main Fuse Cabinet (DCPDPCB02A), Main DC Distribution Panel A (DCPDPCB03A), TSC Battery A Fused Disconnect (DCPDPCB05A), Instrument BUS B Constant Voltage Transformer (CVTA1), Instrument BUS A Constant Voltage Inverter/Transformer (INVTCVTA), Battery Charger A (BYCA), and Battery Charger 1A (BYCA1).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Extra Battery Cells

### Fire Protection

Suppression System(s)

- No fixed fire suppression systems have been provided.
- Portable fire extinguishers are available in adjacent fire areas/zones.
- Hose stations are available in adjacent fire areas/zones.

Detection System(s)

- Smoke Detection Zone 42 provides area detection for the room

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | 2 hour rated 6" thick poured concrete to the Relay Room (Fire Area CC/Fire Zone RR) |
| Floor: | Non-rated poured concrete to grade. |
| North Boundary: | 2 hour rated 8" thick hollow concrete block wall to Turbine Building (Fire Area BOP/Fire Zone TB-l) (Also provided with metal steam line break barrier wall to shield block wall on Turbine Building side) |

| Boundaries | |
|---|---|
| South Boundary: | Non-rated 20" thick poured reinforced concrete barrier to grade. |
| East Boundary: | 2 hour rated 8" thick hollow concrete block wall to Battery Room 1B (Fire Area BR1B) |
| West Boundary: | 2 hour rated 8" thick hollow concrete block wall to Control Building Air Handling Room (Fire Area CC1Fire Zone AHR) |

Doors

- F25 - 3 hour rated fire door in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- S49F - 1 1/2 hour rated fire door in east wall to Battery Room 1B (Fire Area BR1B)

Dampers

- BA-28 - 1 1/2 hour curtain type fire damper in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-1)
- BA-33 - 1 1/2 hour curtain type fire damper in west wall to Air Handling Room (Fire Area CC/Fire Zone AHR)
- BA-38 - 1 1/2 hour curtain type fire damper in west wall to Air Handling Room (Fire Area CC/Fire Zone AHR)
- BB-46 - 1 1/2 hour curtain type fire damper in east wall to Battery Room 1B (Fire Area BR1B)
- BB-47 - 1 1/2 hour curtain type fire damper in east wall to Battery Room 1B (Fire Area BR1B)

Special Provisions

- Ceiling structural steel is provided with Albi-Clad fire proofing materials which provides a one hour rating.
- An air flow monitor with an alarm to the Control Room is provided to protect against the possible build-up of hydrogen gas in the Battery Room. In addition, the outside air intake duct in the adjacent air handling room zone is provided with a stop to prevent air intake damper from fully closing.
- Room is provided with a floor drain with backflow protection capability.

## Combustible Loading

Floor Area = 461 $ft^2$
Equivalent Fire Severity Classification: MEDIUM* (60,000 BTU/$ft^2$ to less than 120,000 BTU/$ft^2$)
Major Combustibles: Battery Cases, Cable Insulation

* Evaluated to not challenge installed features in the room.

## Potential Hazards

- The battery casings may be ruptured by a fire in this area releasing hydrogen gas and sulfuric acid. Provide proper ventilation of the area into the Turbine building to prevent hydrogen build up.

## NRC Approvals from NFPA 805 Chapter 3 Requirements

- None

## Engineering Evaluations

- ME-91-0022, Rev. 1, Analysis of Penetrations of A & B Battery Rooms NCR 91-410, dated 7/31/91
- DA-ME-93-119, Rev. 0, Analysis of Replacement Fire Dampers for AH-44, BA-33 and BB-46, dated 8/13/93
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95 (fire proofing evaluation and lack of automatic suppression capability)
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions For Transition to NFPA 805.

## 7.5 Fire Area BR1B

This room is separated from adjacent zones and fire areas by 8" reinforced concrete block walls with a 3 hour rated door to the Turbine Building and a 1 1/2 hour rated door to Battery Room 1A. Ventilation openings to the Turbine Building and Battery Room 1B are protected with fire rated dampers. Ceiling structural steel is provided with fire proofing materials which provides a one hour rating.

## Battery Room 1B

**Fire Area BR1B**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Battery B (BTRYB), Battery B Main Disconnect (DCPDPCB01B), Battery B Main Fuse Cabinet (DCPDPCB02B), Main DC Distribution Panel B (DCPDPCB03B), TSC Battery B Fused Disconnect (DCPDPCB05B), Instrument BUS D Constant Voltage Transformer (CVTA2), Instrument BUS C Constant Voltage Inverter/Transformer (INVTCVTB), Battery Charger B (BYCB), and Battery Charger 1B (BYCB1).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Battery Cells for Satellite Station A (SSA) and Satellite Station C (SSC)

### Fire Protection

Suppression System(s)

- No fixed fire suppression systems have been provided.
- Portable fire extinguishers are available in adjacent fire areas/zones.
- Hose stations are available in adjacent fire areas/zones.

Detection System(s)

- Smoke detection Zone 43 provides area detection for the room.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | 2 hour rated 6" thick poured concrete to the Relay Room (Fire Area CC/Fire Zone RR). |
| Floor: | Non-rated poured concrete to grade. |

| Boundaries | |
|---|---|
| North Boundary: | 2 hour rated 8" thick hollow concrete block wall to the Turbine Building (Fire Area BOP1Fire Zone TB-1) (Also provided with metal steam line break barrier wall to shield block wall on Turbine Building side) |
| South Boundary: | Non-rated 20" thick poured reinforced concrete barrier to grade. |
| East Boundary: | Non-rated 20" thick poured reinforced concrete barrier to grade. Upper portion of wall is concrete block and non-rated to the exterior |
| West Boundary: | 2 hour rated 8" thick hollow concrete block wall to Battery Room 1A (Fire Area BR1A) |

Doors

- F26 - 3 hour rated fire door in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- S49F - 1 1/2 hour rated fire door in west wall to Battery Room 1A (Fire Area BR1A)

Dampers

- BB-37 - 1 1/2 hour curtain type fire damper in the north wall to the Turbine Building (Fire Area BOP/Fire Zone TB-1)
- BB-46 - 1 1/2 hour curtain type fire damper in the west wall to Battery Room 1A (Fire Area BR1A)
- BB-47 - 1 1/2 hour curtain type fire damper in the west wall to Battery Room 1A (Fire Area BR1A)

Special Provisions

- Ceiling structural steel is provided with Albi-Clad fire proofing materials which are one hour rated.
- Hemyc wrap protects DC power feed E20 from main DC distribution cabinet A to emergency D/G A distribution panel.
- Hemyc wrap protects DC control panel feed E22 to MCC H.
- Hemyc wrap protects conduit for emergency D/G A power feed L318 to 480V AC Bus 14.
- Hemyc wrap protects the power feed to MCC H C687 from MCC C.
- Hemyc wrap protects DC power feed E53 from main DC distribution cabinet A to Auxiliary building distribution panel A.
- An air flow monitor with an alarm to the Control Room is provided to protect against the possible build-up of hydrogen gas in the Battery Room. In addition, the outside air intake duct in the adjacent air handling room is provided with a stop to prevent air intake dampers from fully closing.
- There is a tear in Hemyc wrap HWCB03 as identified in IR 04108798. In accordance with ECP-18-000200-309-101-01, the area near the Hemyc wrap tear reaches a maximum temperature of 101 $^{0}$C at 30 minutes. These values are less than the damage temperature of thermoplastic cables (i.e. 205 $^{0}$C), and therefore, the tear is considered acceptable without repair.

**Combustible Loading**

Floor Area = 487 $ft^2$
Equivalent Fire Severity Classification: MEDIUM* (60,000 BTU/$ft^2$ to less than 120,000 BTU/ $ft^2$)
Major Combustibles: Battery Cases, Cable Insulation

* Evaluated to not challenge installed features in the room.

**Potential Hazards**

- The battery casings may rupture by a fire in this area releasing Hydrogen Gas and Sulfuric Acid. Provide proper ventilation of the area into the Turbine Building to prevent Hydrogen buildup.

**NRC Approval from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-EE-94-054, Rev. 0, Ampacity of Cables Covered with HEMYC Fire Wrap, dated 6/15/98.
- EWR 3986-6, Rev. 0, Appendix R Fire Wraps, dated 12/15/89
- EWR 3986, Rev. 2, Effects of Heat Transfer to Fire Wrapped Conduit Through Conduit Supports During Potential Fires, dated 10/11/88
- ME-91-0022, Rev. 1, Analysis of Penetrations of A & B Battery Rooms NCR 91-410, dated 7/31/91
- DA-ME-93-119, Rev. 0, Analysis of Replacement Fire Dampers for AH-44, BA-33 and BB-46, dated 8/13/93
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions For Transition to NFPA 805.
- 0028-0018-000-001, Rev. 2, Qualification of Hemyc Fire Barrier Wrap in Battery Room B of Ginna Nuclear Station
- ECP-18-000200, Technical Evaluation for Tear in Hemyc wrap HWCB03

## 7.6 Fire Area CC

Fire Area CC consists of three fire zones on the three elevations of the Control Building Complex:

| | |
|---|---|
| Zone AHR | Air Handling Room, Elevation 253'-6" |
| Zone CR | Control Room, Elevation 289'-6" |
| Zone RR | Relay Room, Elevation 271'-0" (includes MUX and Annex rooms) |

The control complex, housing control and power related equipment, is a three story structure. It is bounded on the north by the turbine building, on the south and west by outside walls adjacent to the transformer yard area, and on the east by outside walls exposed to grade. Fire barrier construction materials include reinforced concrete and concrete block.

Zone AHR is the Control Building Air Handling Room and contains ventilation equipment for the control room and Battery rooms. The walls between this room and battery room A are 8" reinforced concrete block. All power and control cables from the cable tunnel enter the control complex in the northwest corner of this zone. The majority of the cable trays turn vertically upward to the next elevation. A barrier of ceramic fiber sandwiched construction with foamed-in-place silicon rubber is installed at the point where the cable trays penetrate the floor above and also the cable tunnel to the west.

Zone CR is the Control Room and houses the control room, a kitchen, SS office and lavatory. Combustibles in this zone are in discrete locations and consist primarily of cable insulation contained in metal cabinets and inside the main control board.

Zone RR is the Relay Room and is bounded on the east and south by outside walls, and on the north by the turbine building. The north wall is constructed of 8" reinforced concrete block. Ventilation cooling is provided by two self contained circulating air conditioning units. No provision is made for mechanical exhaust or supply air. The safety related equipment located in this zone consists of the following cabinets: auxiliary relays, safety injection system, chemical and volume control system, reactor coolant system, rod position indication, protective relays, and relay logic and test. This zone serves as the cable spreading area for safety related cables.

Zone RR also includes the Relay Room Annex area and is separated from the Relay Room by metal siding wall that does not provide a fire rating.

Zone RR also includes the Mux Room (computer room) and is separated from the relay room by 9' high partition walls. These walls have a 2 hour fire resistance rating but the east wall includes an open doorway. The ceiling is a one hour rated gypsum material suspended ceiling. **Note:** PCR 96-125 combined this area into the Relay Room fire zone since the room was removed from the Control Room HVAC system and requires room ventilation by the two Relay Room recirculation HVAC units.

The halon suppression systems were also modified and combined under PCR 96-125 so that both systems actuate.

## Control Building Complex
## Air Handling Room

**Fire Area CC**

**Fire Zone AHR**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Control Building 120/208V distribution panel B1 (ACPDPCB03)

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Battery Rooms HVAC Unit and Battery Rooms DC Powered Auxiliary Ventilation Fan, Control Room HVAC Equipment.

**Fire Protection**

Suppression System(s)

- S06 is an automatic deluge suppression system which provides suppression protection over the cable trays in the northern section in the area of the Cable Tunnel barrier.
- Portable fire extinguishers are available in this zone and in adjacent fire areas/zones.
- Hose stations are available in adjacent fire areas/zones.

Detection System(s)

- S06 smoke detectors actuate suppression system S06.
- No fixed detection systems have been provided other than those which actuate suppression system S06.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated 6" thick poured concrete Relay Room (Fire Area CC/Fire Zone RR). |
| Floor: | Non-rated poured concrete to grade. |
| North Boundary: | 2 hour rated 8" thick hollow concrete block wall to Turbine Building (Fire Area BOP/Fire Zone TB-l) (Also provided with metal steam line break barrier wall to shield block wall on Turbine Building side) |

| Boundaries | |
|---|---|
| South Boundary: | Non-rated 20" thick poured reinforced concrete barrier to grade. |
| East Boundary: | 2 hour rated 8" thick hollow concrete block wall to Battery Room 1A (Fire Area BR1A) |
| West Boundary: | Non-rated 20" thick poured reinforced concrete barrier to grade. Non-rated composite sheet metal and insulating material smoke barrier to the cable tunnel (Fire Area CT) (See DA-ME-94-118-06) |

Doors

- F24 (active leaf) and F24-1 (inactive leaf) - 3 hour rated double fire door in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-2).

Dampers

- AH-39 - 1 1/2 hour curtain type fire damper in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-1)
- AH-44 - 1 1/2 hour curtain type fire damper in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-1)
- AH-53 - 1 1/2 hour curtain type fire damper in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-1)
- BA-33 - 1 1/2 hour curtain type fire damper in east wall to Battery Room 1A (Fire Area BR1A)
- BA-38 - 1 1/2 hour curtain type fire damper in east wall to Battery Room 1A (Fire Area BR1A)

Special Provisions

- The ceiling is not rated due to lack of ceiling support steel fire proofing. However, the ceiling barrier is capable of 2 hour rating. (DA-ME-94-017, p. 16)
- An unused equipment drain has been equipped to prevent backflow from the Turbine Building and is provided with a fire damper, AH-53. This equipment is intended to allow water out of the room and into the Turbine Building.
- Flammastic was applied to all non IEEE-383 cables at the cable tunnel smoke barrier interface.
- Room is provided with a floor drain with backflow prevention capability. (Refer to EWR 2720)

**Combustible Loading**

Floor Area = 1,055 $ft^2$

Equivalent Fire Severity Classification: MEDIUM (60,000 BTU/$ft^2$ to less than 120,000 BTU/$ft^2$)

Major Combustibles: Cable Insulation

**Potential Hazards**

- 480 volt cables are routed in cable trays overhead
- Charcoal Filters in Control Room charcoal filter unit will burn with a very intense heat

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- ME-91-0020, Rev. 0, Analysis of Penetrations AH-45-P and AH-9A-P, dated 5/20/91
- ME-91-0022, Rev. 1, Analysis of Penetrations of A & B Battery Rooms NCR 91-410, dated 7/31/91
- DA-ME-92-101, Rev. 0, Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426, dated 2/28/92
- DA-ME-93-119, Rev. 0, Analysis of Replacement Fire Dampers for AH-44, BA-33 and BB-46, dated 8/13/93
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95
- DA-ME-94-118-06, Rev. 0, Fire Barrier Seal Qualification Analysis for Cable Tunnel Air Handling Room Smoke Barrier (PENQ-06), dated 1/12/95
- DA-ME-94-118-07, Rev. 0, Fire Barrier Seal Qualification Analysis for Relay Room Floor Penetration RR-SB-462-P (PENQ-07), dated 1/12/95
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## Control Building Complex
## Control Room

**Fire Area CC**

**Fire Zone CR**

**Elevation 289'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

TDAFW Pump discharge flow indicator (FI-2031), Main Control Board (MCB) DC distribution panel A/B (DCPDPCB04A/DCPDPCB04B), CR Lavatory exhaust fan discharge damper to outside (AKD02), CREATS Train A toilet exhaust isolation damper (AKD03), Instrument BUS A/B,C,D (IBPDPCBAR/ IBPDPCBBW/ IBPDPCBCB/ IBPDPCBDY), SG A (LI-461), SG A/B wide range level (LI-504/LI-507), SG A pressure indicator (PI-469), SG B pressure indicators (PI-478 and PI-479), Pressurizer level (LI-426 and LI-428), RCS pressure indicators (PI-420-2, and PI-420A), RCS Loop temperature indicators (TI-409B-1 and TI-410B-1), RWST level indicators (LI-920 and LI-921), Condensate Storage Tank A/B Level Indicators (LI-2022A/B), Steam Generator A and B pressure indicators (PI-468 and PI-482A), Steam Generator B pressure indicator (PI-483A), Steam Generator A and B level indicators (LI-505 and LI-506), NIS Power Range indication (NI-41B and NI-43B), Pressurizer level indicator (LI-427), Steam Generator A level indicators (LI-462 and LI-463), Steam Generator B level indicators (LI-471, LI-472, and LI-473), Steam Generator A Wide Range Level indicator (LI-509), Steam Generator B Wide Range Level indicator (LI-510), RCS Wide Range Pressure indicator (PI-421), and RCS Wide Range Pressure indicator (PI-422).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Satellite Station B, Plant Process Computer System, RMS racks, Incore Detectors, Protection Racks, XY Relay Panel, and Appendix R Emergency Air Packs.

### Fire Protection

Suppression System(s)

- S29 is an automatic deluge spray system which provides a water curtain on the wall between the Control room and the Turbine Building Operating Floor.
- Portable fire extinguishers are available in this zone.
- Hose reels are available for use on the Turbine Building Operating Floor, if required.

**Note:** S29 is supplied by 2 supplies; V-9274 (normally open and operated by heat

detectors associated with S29) and V-9275 (normally closed) (Ref. 33013-1988) which can be manually operated from the TSC South corridor.

Detection System(s)

- S29 heat detectors actuate suppression system S29.
- Z19 smoke and heat detectors provide area detection for the Control Room.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated poured concrete on steel deck with stone ballast composition combined with asphalt roofing. |
| Floor: | Non-rated 6" thick poured reinforced concrete to Relay Room (Fire Area CC/Fire Zone RR) due to unprotected structural steel. |
| North Boundary: | Non-rated steam line break wall barrier to Turbine Building (Fire Area BOP/Fire Zone TB-3). Water deluge suppression system provides an equivalent level of protection. |

| Boundaries | |
|---|---|
| South Boundary: | 3 hour rated 12" thick masonry material wall to exterior hazards (Fire Area YARD) |
| East Boundary: | Non-rated to exterior. |
| West Boundary: | 3 hour rated 12" thick masonry material wall to exterior hazards (Fire Area YARD) |

**Note:** 1 hour separation has been provided between the kitchen and the Control Room.

Doors

- F4 - 1 1/2 hour rated fire door in wall to Control Room Kitchen
- S51F (active leaf) and S51F-1 (inactive leaf) - Non-rated double door in north wall to Turbine Building Operating Floor (Fire Area BOP/Fire Zone TB-3)

Dampers

- CR-147 - 1 1/2 hour rated curtain type damper in ceiling of Control Room Kitchen

Special Provisions

- The kitchen area within the Control Room is provided with a one hour rated gypsum material suspended ceiling, north, east, and south walls.

**Combustible Loading**

Floor Area = 2,100 $ft^2$

Equivalent Fire Severity Classification: LOW (< 60,000 BTU1ft$^2$)
Major Combustibles: Desks, Files, Cable Insulation, Carpet, Plastic, Furniture

## Potential Hazards

- Cables throughout that control safety related equipment.

## NRC Approvals from NFPA 805 Chapter 3 Requirements

- For the use of existing installed non-plenum listed cables routed above the Control Room ceiling (NFPA 805 Chapter 3, section 3.3.5.1).

## Engineering Evaluations

- TE 99-0038, Fire Protection Evaluation for Acceptability of Fire Damper CR-147
- DA-ME-92-105 (ME Calc. No. 91-0034), Rev. 0, Analysis of Fire Barriers Penetration Seals for the Control Room Fire Area and Combustible Loading Projections for Ginna Station, dated 1/21/93
- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations
- DA-EE-97-086, Rev. 0, Assessment of Control Room Fire on Safe Shutdown Motor Operated Valves, dated 10/3/97
- GC5190, Heat Transfer Analysis During a Turbine Building Fire, dated 7/25/78
- EWR-1833-CALC-1, Water Curtain Deluge System, Heat Transfer Analysis and Temperature Detector Response to a Turbine Building Fire, dated 3.12.81
- EWR-1833-CALC-2, Temperature Detector Response to a Turbine Building Fire, dated 9/9/80
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## Control Building Complex
## Relay Room (Includes MUX and Annex Rooms)

**Fire Area CC**

**Fire Zone RR**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Supply and return dampers (AKD21, AKD22, AKD23, AKD24, AKD35A, and AKD35B), CREATS train A/B Fans (AKF10A/AKF10B), CREATS Cooling System Train A/B (AKP07A/AKP07B), Foxboro instrument Rack 1 and 2 (FOX1/FOX2), Instrument power distribution panel A/B/C/D/E (IBPDPCBA/B/C/D/E), Reactor Protection Instrument Rack Y2 (MQ483), Reactor Vessel Level Monitor Rack 1 (RVLMS1), Reactor Vessel Level Monitor Rack 2 (RVLMS2), CREATS lighting panel A/B (ACPDPCB11/ACPDPCB12), MCCN, and MCCP.

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Satellite Station A and C, MCCK, Foxboro instrument Rack 3, TWINCO Units, BUS14 Control Panel, BUS16 Control Panel, MUX 1,2, and 3, and ADFCS.

**Fire Protection**

Suppression System(s)

- S08 is an automatic halon suppression system which provides suppression protection for the Relay and the MUX Computer Rooms. Halon system S07 was combined with S08 under PCR 96-125.
- S09 is a manual deluge suppression system which provides suppression protection for the Relay room south section.
- S10 is a manual deluge suppression system which provides suppression protection for the Relay room west section.
- S11 is a manual deluge suppression system which provides suppression protection for the Relay room northeast section.

- Portable fire extinguishers are available in this zone.
- Hose stations are available in adjacent fire areas/zones.

Detection System(s)

- S08 smoke detectors actuate suppression system S08.
- Z18 heat detectors provide detection for the Relay Room. Annunciation of conditions in the control room results in operator response and manual actuation of systems S09, S10 and/or S11, if needed.
- Z44 smoke detectors provide area detection for the Relay Room Annex.
- High temperature sensors in the CREATS Charcoal Filters provide main control board & Aux. benchboard indication.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated 6" thick poured reinforced concrete to Control Room (Fire Area CC/Fire Zone CR) due to unprotected structural steel. Ceiling of RR Annex is non-rated to exterior. |
| Floor: | 2 hour rated 6" thick poured concrete above Battery Rooms 1A (Fire Area BR1A) and 1B (Fire Area 1B)<br>Non-rated but acceptable floor barrier to Cable Tunnel exit (Fire Area CT) into the Air Handling Room (Fire Area CC/Fire Zone AHR) (DA-ME-94-118-07)<br>Non-rated above Air Handling Room (Fire Area CC/Fire Zone AHR) due to unprotected structural steel |
| North Boundary: | 2 hour 8" thick hollow concrete block wall to Turbine Building (Fire Area BOP/Fire Zone TB-2). Also provided with a metal steam line break wall which shields the block wall on the Turbine Building side. The alcove area and ceiling is two hour rated and is constructed of fire rated drywall materials and metal studs.<br>North wall of annex is 2 hour rated to TSC south hallway. |
| South Boundary: | 3 hour rated 12" thick minimum poured concrete block wall to yard transformer area (Fire Area YARD) |
| East Boundary: | 3 hour rated 12" thick hollow concrete block to TSC Building cable tunnel/south hallway (Fire Area BOP/Fire Zone TSC-1S)<br>Non-rated metal siding material wall to Relay Room Annex and a non-rated poured concrete wall to exterior |
| West Boundary: | 2 hour rated 8" thick minimum poured concrete block entrance to stair tower is considered a property conservation barrier.<br>3 hour rated 12" thick hollow concrete block wall to yard transformer area (Fire Area YARD) |

**Note:** Separation between the Relay Room and Mux Room consists of 2 hour wall barriers and a 1 hour ceiling barrier with an open doorway in the east wall.

Doors

- F502 - 3 hour rated fire door in west wall to stairwell.
- F502A - Non-rated door in east wall to Relay Room Annex
- F504 (active leaf) and F504-1 (inactive leaf) - 3 hour rated double fire door in north wall to Turbine Building (Fire Area BOP/Fire Zone TB-2)
- F507 (active leaf) and F507-1 (inactive leaf) - 3 hour rated double fire door in west wall to Mux Room (Fire Area CC/Fire Zone RRM) (Removed under PCR 96-125.)
- F508 - 3 hour rated fire door in south wall of MUX Room to stairwell

Dampers

- RR-117 - 1 1/2 hour rated curtain type fire damper in north wall of stairwell to MUX Room (Removed under PCR 96-125.) Wall opening was blocked closed.
- RR-120 - 1 1/2 hour rated curtain type fire damper in north wall to MUX Room (EIN Deactivated/Fire Zones Combined under PCR 96-125)
- RR-121 - 1 1/2 hour rated curtain type fire damper in north wall to MUX Room (EIN Deactivated/Fire Zones Combined under PCR 96-125)
- RR-122 - 1 1/2 hour rated curtain type fire damper in north wall to MUX Room (EIN Deactivated/Fire Zones Combined under PCR 96-125)
- RR-123 - 1 1/2 hour rated curtain type fire damper in north wall to MUX Room (EIN Deactivated/Fire Zones Combined under PCR 96-125)

Special Provisions

- Fire suppression systems S09, S10 and S11 will need to be manually actuated if the automatic Halon system does not control the fire.
- Barrier to Relay Room Annex maintained to minimize Halon leakage out of the Relay Room in accordance with Ginna Fire Barrier Penetration Seals Program requirements (includes non-rated door F502A).
- Structural steel fire proofing at the ceiling has not been provided.

## Combustible Loading

Floor Area = 2,565 ft$^2$
Equivalent Fire Severity Classification: HIGH (> 120,000 BTU/ft$^2$)
Major Combustibles: Cable Insulation, PVC, Paper, Charcoal Filter Media

## Potential Hazards

- MCC's K, N, & P have 480 volts.
- Four (4) 4KV electrical buses are routed in this area. (Over MUX Room)

## NRC Approvals from NFPA 805 Chapter 3 Requirements

- None.

## Engineering Evaluations

- RG011843, Fire Protection Evaluation for Justification of the Absence of a Fire Damper in Duct Penetration RR-113-P. (Wall opening was blocked closed under PCR 96-125.)
- ME Calc. 91-0022, Analysis of Penetrations of A & B Battery Rooms NCR 91-410
- DA-ME-92-101, Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426
- DA-ME-92-105 (ME Calc. No. 91-0034), Analysis of Fire Barriers Penetration Seals for the Control Room Fire Area and Combustible Loading Projections for Ginna Station
- DA-ME-94-082, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution (Bus Duct Penetration Evaluation)
- DA-ME-94-118-07, Fire Barrier Seal Qualification Analysis for Relay Room Floor Penetration RR-SB-462-P (PENQ-07)
- NSL-0000-DA025, Justification of Removal of Fire Watch Patrol for Duct Penetration #RR-113. (Ducting was removed and wall opening was blocked closed under PCR 96-125.)
- DA-ME-2000-052, Fire Detection System Evaluation
- DA-ME-2000-064, Rev. 0, Evaluation of Fire Zone RR (Relay Room)
- NESE 1101 (AAF International Analysis); Fire Suppression System Hydraulic Calculations for Control Room Emergency Air Treatment System.
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## 7.7 Fire Area CHG

This fire area includes the Spray Additive Tank Room adjacent to the Charging Pump Room. The walls ceiling of the fire area are three hour rated and contain three hour rated fire doors and fire dampers. Equipment within the area includes Charging Pumps A, B, and C. Charging pumps A and B are required for safe shutdown.

## Auxiliary Building
## Charging Pump Room

**Fire Area CHG**

**Elevation 235'-8"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Charging Pump A/B/C (PCH01A/B/C), RWST to Charging Pump suction AOV (112B), Aux Bldg Emergency Local Instrument Panel (ABELIP), Pressurizer Level indicator (LI-428A), and RCS pressure indicator (PI-420B).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- No fixed fire suppression systems have been provided.
- Portable fire extinguishers are available in adjacent fire areas/zones.
- Hose stations are available in adjacent fire areas/zones.

Detection System(s)

- Z01 smoke detectors provide detection protection in this fire area.
- Pyrotronics area 1 zone 2 provides detection in the ventilation system near the east stairs and the charging pump room.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | 3 hour rated 12" thick minimum poured concrete to Auxiliary Building Mezzanine Floor elevation 253'-0" (Fire Area ABBM/Fire Zone ABM) |
| Floor: | Non-rated 12" thick poured concrete to grade. |

| Boundaries | |
|---|---|
| North Boundary: | Non-rated poured concrete to grade. |
| South Boundary: | 3 hour rated poured concrete to Auxiliary Building Basement (Fire Area ABBM/Fire Zone ABM). |
| East Boundary: | Non-rated poured concrete to grade. |
| West Boundary: | 3 hour rated to Auxiliary Building Basement (Fire Area ABBM/Fire Zone ABM). |

Doors

- F1 - 3 hour rated fire door from Spray Additive Tank Room to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- F2 - 3 hour rated fire door from Charging Pump Room to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)

Dampers

- CP-3 (3) hour rated curtain type fire damper in south wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-4 (3) hour rated curtain type fire damper in south wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-10-1 (3) hour rated curtain type fire damper in south wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-10-2 (3) hour rated curtain type fire damper in south wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-10-3 (3) hour rated curtain type fire damper in south wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-10-4 (3) hour rated curtain type fire damper in south wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-12 (3) hour rated curtain type fire damper in west wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-13 (3) hour rated curtain type fire damper in west wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-13A (3) hour rated curtain type fire damper in west wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)
- CP-31 (3) hour rated curtain type fire damper in south wall of Spray Additive Tank Room to Auxiliary Building (Fire Area ABBM/Fire Zone ABB)

Special Provisions

- Drainage within curbed area to RHR pit is provided. (Refer to EWR 2720)

**Combustible Loading**

Floor Area = 980 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Lube Oil, Cable Insulation

**Potential Hazards**

- Charging Pumps have 480 volt motors.
- 6" curbs across two (2) doorways into the Charging Pump room have been provided.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-93-117B, Rev. 0, Out of Wall and Special Fire Damper Configurations, dated 12/31/94
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## 7.8 Fire Area CT

The cable tunnel connects the control building, auxiliary building, and intermediate building specifically for the purpose of cable routing. The cable tunnel is a reinforced concrete structure approximately 9 feet wide by 7 feet high located entirely below grade.

Where the tunnel is adjacent to other buildings (92 feet along the Turbine Building and 15 feet along the Intermediate Building) the walls provide at least a 3-hour fire resistant barrier. Cables inside the tunnel are installed in trays stacked five high along both walls. The trays contain cables required for safe shutdown, as well as other cables. Separation between trays provides an air space of 10 inches vertically and approximately 3 feet horizontally.

The tunnel entrances in the Control Building and Auxiliary Building are sealed with a metal wall and sandwiched ceramic fiber insulation, with foamed-in-place silicon rubber seals around the cables. The entrance to the intermediate building is via 1 1/2 hour rated fire door F3 and the barrier wall is constructed of fire rated drywall materials. The access door into the cable tunnel from the Auxiliary Building was sealed closed. Emergency exit hatch to the transformer yard was sealed closed under PCR 2004-0022.

## Cable Tunnel

**Fire Area CT**

**Elevations 260'-6" & 260'-10"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

There are cables throughout the fire area which control Safe Shutdown Related equipment.

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- S05 is an automatic deluge suppression system which provides suppression protection for the entire Cable Tunnel.

Detection System(s)

- S05 smoke detectors actuate suppression system S05.
- Z05 heat detectors provide detection alarm indication for the entire Cable Tunnel.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Masonry slab barrier $\geq$ 12" poured concrete. |
| Floor: | Non-rated to grade, except floor above Intermediate Building sub-basement |
| North Boundary: | 3 hour rated to Turbine Building Basement (Fire Area BOP/Fire Zone TB-1) |
| South Boundary: | Non-rated smoke barrier to Auxiliary Building Intermediate floor (Fire Area ABBM/Fire Zone ABM) |
| East Boundary: | Non-rated smoke barrier to Air Handling Room (Fire Area CC/Fire Zone AHR) |
| West Boundary: | Non-rated smoke barrier to Intermediate Building Clean Side Basement (Fire Area ABI/Fire Zone IBN-1) |

Doors

- F3 - 1 1/2 hour rated fire door in west wall to Intermediate Building (Fire Area ABI/Fire Zone IBN-1).
- F3A1 - Non-rated smoke barrier door in south wall to Auxiliary Building (Fire Area ABBM/Fire Zone ABM) (sealed closed)

Dampers

- None

Special Provisions

- Transformer yard area is provided with an underground drainage system to the collection pond which is located south of the Nuclear Assessment Building.
- Flammastic was applied to all non IEEE-383 cables in the three cable tunnel smoke barrier interfaces with the Auxiliary Building, Intermediate Building and Control Building ventilation rooms.

**Combustible Loading**

Floor Area = 1,448 $ft^2$.
Equivalent Fire Severity Classification: HIGH (> 120,000 $BTU/ft^2$)
Major Combustibles: Cable Insulation

**Potential Hazards**

- Maneuvering within the Cable Tunnel is severely limited, especially when SCBAs are worn. Visibility will be restricted when fire fighting actions are in progress.
- Extreme caution should be exercised due to electrical hazards.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-101, Rev. 0, Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426, dated 2/28/92
- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95 (addresses non-rated emergency exit personnel hatch)
- DA-ME-94-118-04, Rev. 0, Fire Barrier Penetration Seal Qualification Analysis for Cable Tunnel Intermediate Smoke Barrier (PENQ-04), dated 1/12/95
- DA-ME-94-118-05, Rev. 0, Fire Barrier Seal Qualification Analysis for Cable Tunnel Auxiliary Building Smoke Barrier (PENQ-05), dated 1/12/95

- DA-ME-94-118-06, Rev. 0, Fire Barrier Seal Qualification Analysis for Cable Tunnel Air Handling Room Smoke Barrier (PENQ-06), dated 1/12/95
- EWR 3986, Rev. 2, Effects of Heat Transfer to Fire Wrapped Conduit Through Conduit Supports During Potential Fires, dated 10/11/88
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805
- Cable Tunnel Automatic deluge system S05 was designed with a density of 0.5 gpm/sq. ft of floor area which is equivalent to the NFPA 15 requirement of 0.15 gpm/sq.ft on horizontal or vertical plane containing the cable tray [Ref. RG002621 Enclosure 1].

## 7.9 Fire Area EDG1A

The diesel generator building is located on the northeast corner of the turbine building. The fire area includes the cable vault area below. Access to the vault is through a covered opening, approximately 2 feet in diameter in the floor. Fire Area EDG1A contains emergency diesel generator 1A and associated cables. The fire area is separated from adjacent fire areas by three hour rated barriers.

## Diesel Generator Unit lA including EDG Vault lA

**Fire Area EDGlA**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

D/G A (KDG01A), D/G A Fuel Oil Day Tank (TDG04A), D/G A Fuel Oil Day Tank Alarm and Control (LIT-2050A), D/G Fuel Oil Transfer Pump A (PDG02A), D/G A Emergency Cooling Feed valve (8588A), MCCH, D/G A Service Water (SW) isolation valves (4598G and 4598H), SW inlet block valve to D/G A Heat Exchangers (4667), Hose connection isolation valve to D/G A HXs (4667F), D/G A Room Cooling Fans (ADF01A and ADF01B) and associated outlet dampers (ADD01A and ADD01B), D/G A DC distribution panel (DCPDPDG01A), and Diesel Generator Fuel Oil Day Tank SOV (5907).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- S12 is an automatic pre-action suppression system which provides suppression protection for the Diesel Generator Room. (Upgraded under PCR 2001-0021)
- Portable fire extinguishers are available in this area.
- Hose stations are available in adjacent fire areas/zones as well as exterior yard hydrant lines.

Detection System(s)

- S12 heat detectors actuate suppression system S12.
- Z20 smoke detector provides detection protection for the Diesel Generator Vault.

### Design Features

### Boundaries

| Diesel Generator Unit 1A Room: | |
|---|---|
| Ceiling: | Non-rated to exterior. |

| Diesel Generator Unit lA Room: | |
|---|---|
| Floor: | Non-rated poured concrete to grade.<br>Non-rated plate to vault area. |
| North Boundary: | Non-rated to exterior. |
| South Boundary: | 3 hour rated 12" thick poured reinforced concrete to Turbine Building (Fire Area BOP/Fire Zone TB-l). Also provided with a metal pressure wall barrier which is constructed of materials for steam line break concerns. |
| East Boundary: | 3 hour rated 12" thick poured reinforced concrete to Diesel Generator lB (Fire Area EDGlB) |
| West Boundary: | 3 hour rated 12" thick poured reinforced concrete to Turbine Oil Storage Building (Fire Area BOP/Fire Zone TO) |

| EDG lA Vault: | |
|---|---|
| Ceiling: | Non-rated concrete and plate to EDG1A room. |
| Floor: | Non-rated to grade. |
| North Boundary: | Non-rated to grade. |
| South Boundary: | Non-rated to grade. |
| East Boundary: | 3 hour rated to EDGlB Vault |
| West Boundary: | Non-rated to grade. |

Doors

- Fire doors F30 (active leaf) and F30-l (inactive leaf) - 3 hour rated double fire door in south wall to Turbine Building (Fire Area BOP/Fire Zone TB-l).

Dampers

- None

Special Provisions

- The diesel generator is provided with an alternate cooling water feed connection which is relied on for fires which could impact normal cooling water flow from the service water pumps. (Reference: DA-ME-2000-062)
- Fire hose can be attached to the diesel generator alternate cooling feed and used for suppression.
- Drain sump pumps have been provided along with backflow prevention capability. (Refer to EWR 2720)

- The manhole to the vault from the Diesel Generator Room is sealed to minimize water and flammable liquids from entering the vault.
- Foam cart plus 15 gallons of foam and a Hi-Rise pack are available in the Turbine Building Basement.

**Combustible Loading**

Floor Area = 1,466 $ft^2$
Equivalent Fire Severity Classification: MEDIUM* (60,000 BTU/$ft^2$ to less than 120,000 BTU/$ft^2$)
Major Combustibles: Diesel Fuel, Lube Oil, Cable Insulation, PVC

* Evaluated not to challenge existing area features.

**Potential Hazards**

- 350 gallon (nominal) Diesel Fuel Day Tank is at the north end of the generator.
- South end of Diesel Generator A is a 480 volt generator.
- The Fuel Oil Transfer Pump and MCC H are 480 volts.
- 4 kv lines are routed in the Cable Vault.
- Partial vacuum may be created in the vault as a result of a fire in the vault.
- Fire may propagate in the void area between the ceiling and roof area.
- EDG A vault contains an exposed bus bar.

**NRC Approval from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-94-004, Rev. 0, dated 1/12/94, Fire Protection Hose Reels
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-062, Evaluation of the Impact of Fire on Service Water Piping in EDG1B, Rev. 0
- DA-ME-2002-040, Hydraulic Sprinkler Calculations for the Diesel Generator Rooms A and B, Rev. 2, dated 10/24/03, PCR 2001-0021

## 7.10 Fire Area EDG1B

The diesel generator building is located on the northeast corner of the turbine building. The fire area includes the cable vault area below. Access to the vault is through a covered opening, approximately 2 feet in diameter in the floor. Fire Area EDG1B contains emergency diesel generator 1B and associated cables. The fire area is separated from adjacent fire areas by three hour rated barriers. Separation of redundant cabling in the vault is provided by an upgraded barrier wall which was installed under PCR 2002-0018 and evaluated under analysis DA-ME-2003-018 which determined that the upgraded barrier significantly improved the fire protection capabilities of the barrier wall which was removed.

## Diesel Generator Unit IB including EDG Vault IB

**Fire Area EDGIB**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

D/G B (KDG01B), D/G B Fuel Oil Day Tank (TDG04B), D/G B Fuel Oil Day Tank Alarm and Control (LIT-2051A), D/G Fuel Oil Transfer Pump B (PDG02B), D/G B Emergency Cooling Feed valve (8589A), MCCJ, D/G B Service Water (SW) isolation valves (4599G and 4599H), SW inlet block valve to D/G B Heat Exchangers (4668A), Hose connection isolation valve to D/G B HXs (4668F), D/G B Room Cooling Fans (ADF02A and ADF02B) and associated outlet dampers (ADD02A and ADD02B), Turbine Bldg SW Isol Valve MOV (4670), D/G B DC distribution panel (DCPDPDG01B), D/G B manual breaker to BUS 17(52/EG1B3), and Diesel Generator Fuel Oil Day Tank SOV (5908).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s)

- S13 is an automatic pre-action suppression system which provides suppression protection for the Diesel Generator Room.
- Portable fire extinguishers are available in this area.
- Hose stations are available in adjacent fire areas/zones as well as exterior yard hydrant lines if needed.

Detection System(s)

- S13 heat detectors actuate suppression system S13. (Upgraded under PCR 2001-0021)
- Z21 smoke detector provides detection protection for the Diesel Generator Vault.

### Design Features

### Boundaries

| EDG1B Room: | |
|---|---|
| Ceiling: | Non-rated to exterior. |

| EDG1B Room: | |
|---|---|
| Floor: | Non-rated poured concrete to grade.<br><br>Non-rated plate to vault area. |
| North Boundary: | Non-rated poured concrete to exterior. |
| South Boundary: | 3 hour rated 12" thick poured concrete to Turbine Building Basement (Fire Area BOP/Fire Zone TB-1). Also provided with a metal pressure wall barrier which is constructed of materials for steam line break concerns. |
| East Boundary: | Non-rated poured concrete to exterior. |
| West Boundary: | 3 hour rated 12" thick poured concrete to Diesel Generator Room A. |

| EDG 1B Vault: | |
|---|---|
| Ceiling: | Non-rated concrete and plate to EDG1B room. |
| Floor: | Non-rated to grade. |
| North Boundary: | Non-rated to grade. |
| South Boundary: | 3 hour equivalent rated barrier to provide separation between control circuits for both diesels. The barrier is constructed of two rows of clay fire brick masonry for a nominal thickness of eight inches. A fire damper is installed into the barrier wall for access to the interior and is in the closed position when the plant is at power operation. DA-ME-2003-018 Rev. 1 addresses the equivalent rating of this barrier wall. |
| East Boundary: | Non-rated to grade. |
| West Boundary: | Non-rated to grade since grade separates A & B D/G Vaults. |

Doors

- F29 (active leaf) and F29-1 (inactive leaf) - 3 hour rated double fire door in south wall to Turbine Building (Fire Area BOP/Fire Zone TB-1).

Dampers

- DGVB-85 (3) hr rated

Special Provisions

- The diesel generator is provided with an alternate cooling water feed connection which is relied on for fires which could impact normal cooling water flow from the service water pumps. (Reference: DA-ME-2000-062)

- Fire hose can be attached to the diesel generator alternate cooling feed and used for suppression.
- Drain sump pumps have been provided and are provided with backflow prevention capability. (Refer to EWR 2720)
- The manhole to the vault from the Diesel Generator Room is sealed to minimize water and flammable liquids from entering the vault.
- In the vault, a spray on fire retardant coating is provided on power cables for both diesel generators within 5' of the duct bank to the Auxiliary Building.
- Foam cart plus 15 gallons of foam and a Hi-Rise pack are available in the Turbine Building Basement.

**Combustible Loading**

Floor Area = 1,451 $ft^2$
Equivalent Fire Severity Classification: MEDIUM* (60,000 BTU/$ft^2$ to less than 120,000 BTU/$ft^2$)
Major Combustibles: Diesel Fuel, Lube Oil, Cable Insulation, PVC

* Evaluated to not challenge installed features.

**Potential Hazards**

- 350 gallon (nominal) Diesel Fuel Day Tank is at the north end of the Generator.
- South end of Diesel Generator B is a 480 volt generator.
- The Fuel Oil Transfer Pump, starting air compressor, and MCC J are 480 volts.
- Cables routed in overhead tray contain 4160 volt lines.
- 4 kv lines are routed in the cable vault.
- Partial vacuum may be created in the vault as a result of a fire in the vault.
- Fire may propagate in the void area between the ceiling and roof area.
- Vault contains an exposed bus bar.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-93-036, Rev. 0, 3M CS-195 Material Substitution/Equivalency Evaluation, dated 10/4/93 (Historical)

- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95 and the reconfiguration of Fire Area EDG1B (Historical)
- DA-ME-94-118-03, Rev. 0, Fire Barrier Penetration Seal Qualification Analysis for D/G AB" Vault Barrier Enclosure (PENQ-03), dated 1/13/95. CATS 13782 is tracking the revision to this DA
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2000-062, Evaluation of the Impact of Fire on Service Water Piping in EDG1B, Rev. 0
- DA-ME-2002-040, Hydraulic Sprinkler Calculations for the Diesel Generator Rooms A and B, Rev. 2, dated 10/24/03, PCR 2001-0021
- DA-ME-2003-018 Rev. 1, Replacement of Appendix R Fire Barrier in the "B" Diesel Generator Vault, dated 10/11/2004, PCR 2002-0018
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## 7.11 Fire Area RC

The reactor containment, which is considered as one fire area (Fire Area RC), consists of seven fire zones on various elevations of the Containment Building:

| | |
|---|---|
| RC-l | Reactor Containment Building Basement Floor, Elevation 235'-8" |
| RC-2 | Reactor Containment Building Intermediate Floor, Elevation 253'-3" |
| RC-3 | Reactor Containment Building Operating Floor, Elevations 274'-6" & 278'-4" |
| T-LOOPA | Reactor Containment “A” Loop, Elevations 235’-8”, 253’-3”, 274’-6”, and 278’-4” |
| T-LOOPB | Reactor Containment “B” Loop, Elevations 235’-8”, 253’-3”, 274’-6”, and 278’-4” |
| T-REACTOR | Reactor Containment Cavity Area, Elevation 253’-3” |
| T-PRZR | Reactor Containment Pressurizer, Elevation 274’-6” |

The reactor containment is completely separated from all other structures and areas by its walls and dome, constructed of reinforced concrete, and an inside steel liner. Connections with the auxiliary building and intermediate building are through sealed penetrations and personnel access is through an air lock entrance hatch which exceeds the requirements of a 3-hour fire barrier. Two reactor coolant pumps are located below the operating floor at elevation 274'-6". The reactor coolant pumps are enclosed by concrete shielding walls. These walls are not continuous at the basement elevation of 235'-8". In addition, radiant energy shields have been used to separate pressurizer level, source range neutron monitor, and reactor coolant system pressure indication circuits inside containment. A lube oil collection system is provided on each Reactor Coolant Pump.

## Reactor Containment Building
## Basement Floor

**Fire Area RC**

**Fire Zone RC-1**

**Elevation 235'-8"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Excess Letdown Flow Control Valve (123), Letdown orifice AOVs (200A, 200B, and 202), Charging to Loop B cold leg AOV (294), Aux Spray AOV (296), Excess letdown heat exchanger divert to VCT or RCDT AOV (312), Charging to Loop B hot leg AOV (392A), RHR Pump suction from RCS LOOP A MOV (701), and RHR discharge to LOOP B MOV (720).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Reactor, SI Accumulators A and B, Reactor Coolant Drain Tank, Regenerative Heat Exchanger, and A/B Sumps.

### Fire Protection

Suppression System(s)

- No fixed suppression systems have been provided.
- Hose stations are available in this zone.

Detection System(s)

- Z08 thermistor detection provides detection protection in the cable trays.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Reactor Containment Intermediate Floor (Fire Area RC/ Fire Zone RC-2) |
| Floor: | Non-rated to grade. |
| North Boundary: | Greater than 3 hour separation to the Intermediate Building Sub-basement (Fire Area ABI/Fire Zone IB-0) |
| South Boundary: | Greater than 3 hour fire separation to the Auxiliary Building Basement (Fire Area ABBM/Fire Zone ABB) |
| East Boundary: | Non-rated to grade. |
| West Boundary: | Greater than 3 hour fire separation to the Intermediate Building Sub-basement (Fire Area ABI/Fire Zone IB-0) |

Doors

- None

Dampers

- None

Special Provisions

- Float valves have been provided in drain boxes to minimize backflow. (Refer to EWR 2720)

**Combustible Loading**

Floor Area = 6,421 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Lube Oil, Cable Insulation

**Potential Hazards**

- RCP lube oil collection tanks

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-140, Containment Hose Reel Hydraulic Calculation, dated 12/14/93
- TSR 94-051, Rev. 0, Appendix R Conformance Review of Reactor Stud Stands and Telephone Cables in Containment, dated 4/11/94
- Bechtel RCP oil collection system evaluations M-97-001 and ESM-97-009.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Reactor Containment Building
## Intermediate Floor

**Fire Area RC**

**Fire Zone RC-2**

**Elevation 253'-3"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Containment Recirc Fan A/B/C/D (ACF08A/B/C/D), Pressurizer Level Transmitter (LT-427), Pressurizer Pressure Transmitters (PT-429, PT-430, and PT-431), CCW from RCP A/B Thermal Barrier AOVs (754A/B), and Presssurizer Pressure Transmitter (PT-449).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Reactor, Steam Generator A and B, SI Accumulator A and B, Seal Table, and Hydrogen Recombiners.

### Fire Protection

Suppression System(s)

- No fixed suppression systems have been provided.
- Hose stations are available in this zone.

Detection System(s)

- Z13 thermistor detection provides detection protection around the Reactor Coolant Pump A.
- Z14 thermistor detection provides detection protection around the Reactor Coolant Pump B.
- Z15 thermistor detection provides detection protection in the cable trays.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to Reactor Containment Operating Floor (Fire Area RC/ Fire Zone RC-3). |
| Floor: | Non-rated to Reactor Containment Basement Floor (Fire Area RC/ Fire Zone RC-1). |
| North Boundary: | Greater than 3 hour rated to Intermediate Building Clean Side (Fire Area ABI/Fire Zone IBN-1) |

| | |
|---|---|
| South Boundary: | Greater than 3 hour rated to Auxiliary Building (Fire Area ABBM/ Fire Zone ABM)<br><br>Greater than 3 hour rated to Auxiliary Building (Fire Area ABI/Fire Zone ABO) |
| East Boundary: | Non-rated to grade. |
| West Boundary: | Greater than 3 hour rated to Intermediate Building Controlled Side (Fire Area ABI/Fire Zone IBS-1) |

Doors

- None

Dampers

- None

Special Provisions

- Hemyc wrap has been provided to protect the source range monitor (N31) and circuit R1467 from penetration CD-9 to the 1B RCP shield wall for defense-in-depth.
- Hemyc wrap has been provided to protect pressurizer level transmitter (LT433) and circuit R1133 and reactor coolant system pressure transmitter PT420A and circuit R877A from the transmitter to about 20' from the AE penetrations for defense-in-depth.
- The Reactor Coolant Pumps are provided with spillage oil collection systems.

**Combustible Loading**

Floor Area = 6,031 ft$^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/ft$^2$)
Major Combustibles: Cable Insulation

**Potential Hazards**

- Oil for the Reactor Coolant Pump provides a significant fuel source
- The Reactor Coolant Pump Motors are 4KV

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-EE-94-054, Rev. 0, Ampacity of Cables Covered with HEMYC Fire Wrap, dated 6/15/98
- EWR 3986-6, Rev. 0, Appendix R Fire Wraps, dated 12/15/89
- EWR 3986, Rev. 2, Effects of Heat Transfer to Fire Wrapped Conduit Through Conduit Supports During Potential Fires, dated 10/11/88
- EWR EEA-17001, Rev. 0, Comparison of Radiant Energy Shield with Fire Wrap Perfor-

mance for Conduit Fire Protection, dated 6/12/91

- DA-ME-92-140, Containment Hose Reel Hydraulic Calculation, dated 12/14/93
- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations, dated 12/9/94
- TSR 93-089, Rev. 0, Containment Wood Spacer, dated 3/14/94
- TSR 94-051, Rev. 0, Appendix R Conformance Review of Reactor Stud Stands and Telephone Cables in Containment, dated 4/11/94
- Bechtel RCP oil collection system evaluations M-97-001 and ESM-97-009.
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Reactor Containment Building
## Operating Floor

**Fire Area RC**

**Fire Zone RC-3**

**Elevations 274'-6" & 278'-4"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Accumulator to Surge Tank SOV for PORV 431C (8616A), Accumulator to Surge Tank SOV for PORV 431C (8616B), and SG A/B Level Transmitters (LT-462, LT-463, LT-471, LT-472, and LT-473).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Steam Generators A and B, and the Reactor.

**Fire Protection**

Suppression System(s)

- No fixed suppression systems have been provided.
- Hose stations are available in this area/zone.
- Post accident charcoal filters can be doused with borated water if needed.

Detection System(s)

- Z06 heat detectors provide detection protection for the Containment Auxiliary Charcoal Filter A
- Z07 heat detectors provide detection protection for the Containment Auxiliary Charcoal Filter B
- Z09 heat detectors provide detection protection for the Post Accident Charcoal Filter A
- Z10 heat detectors provide detection protection for the Post Accident Charcoal Filter A
- Z11 heat detectors provide detection protection for the Post Accident Charcoal Filter B
- Z12 heat detectors provide detection protection for the Post Accident Charcoal Filter B
- Z13 thermistor detectors provide detection protection around the Reactor Coolant Pump A
- Z14 thermistor detectors provide detection protection around the Reactor Coolant Pump B

- Z16D2 thermistor and Z16D1 smoke detectors provide area detection for the operating level and cable trays.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to Reactor Containment Intermediate Floor (Fire Area RC/ Fire Zone RC-2). |
| North Boundary: | Greater than 3 hour rated to Intermediate Building Clean Side (Fire Area ABI/Fire Zones IBN-2, IBN-3, IBN-4) |
| South Boundary: | Greater than 3 hour rated to Auxiliary Building (Fire Area ABI/Fire Zone ABO) |
| East Boundary: | Non-rated to exterior. |
| West Boundary: | Greater than 3 hour rated to Intermediate Building Controlled Side (Fire Area ABI/Fire Zone IBS-2, IBS-3) |

Doors

- None

Dampers

- None

Special Provisions

- The Reactor Coolant Pumps are provided with spillage oil collection systems.

**Combustible Loading**

Floor Area = 6,694 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 $BTU/ft^2$)
Major Combustibles: Tivar, Cable Insulation, Charcoal

**Potential Hazards**

- Post Accident Charcoal Filter and Containment Auxiliary Charcoal Filters located above elevation 278'-4" will burn with a very intense heat if they catch fire.
- Overhead crane contains 34 gallons of oil which could present a fire hazard.
- An oil leak may develop in either one of the Reactor Coolant Pumps, resulting in oil being deposited in the storage tanks in the basement via the RCP Lube Oil Collection System.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-92-140, Containment Hose Reel Hydraulic Calculation, dated 12/14/93
- DA-ME-93-117A, Rev. 0, Generic Letter 86-10 Evaluation Containment Electrical Penetrations, dated 12/9/94
- TSR 94-051, Rev. 0, Appendix R Conformance Review of Reactor Stud Stands and Telephone Cables in Containment, dated 4/11/94
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00

## Reactor Containment Building
## Reactor Containment "A" Loop

**Fire Area RC**

**Fire Zone T-LOOPA**

**Elevation: 235'-8", 253'-3", 274'-6", and 278'-4"**

**Safe Shutdown Equipment (SSE) in Area:** Yes

**Major SSE in fire zone** (Reference 3.18):

Steam Generator A (EMS01A), Reactor Coolant Pump A (PRC01A), RHR Pump Suction from RCS MOV (700), Excess Letdown AOV (310), and RCP Seal Outlet AOV (270A).

**Non-Power Ops Pinch Point Area:** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

**Fire Protection**

Suppression System(s):

- No fixed suppression systems have been provided
- Hose stations are available in this zone

Detection Systems(s):

- Z13 thermistor detectors provide detection protection around the Reactor Coolant Pump A

**Design Features**

| |
|---|
| Boundaries: Shown on drawings 33013-2928 sheets 5, 6, and 7. |

Doors: None
Dampers: None
Special Provisions: None

**Combustible Loading**
Floor Area = 709 sq. ft.
Equivalent Fire Severity Classification: LOW (<60,000 BTU/ft$^2$)
Major Combustibles: Lube Oil

## Potential Hazards

- Oil from RCP misting

## NRC Approval from NFPA 805 Chapter 3 Requirement

- For the potential of oil misting from the Reactor Coolant pumps due to normal motor consumption not captured by the oil collection system (NFPA 805 Chapter 3, section 3.3.12 (1)).

## Engineering Evaluations

None

## Reactor Containment Building
## Reactor Containment "B" Loop

**Fire Area RC**

**Fire Zone T-LOOPB**

**Elevation: 235'-8", 253'-3", 274'-6", and 278'-4"**

**Safe Shutdown Equipment (SSE) in Area:** Yes

**Major SSE in fire zone** (Reference 3.18):

Steam Generator B (EMS01B), Reactor Coolant Pump B (PRC01B), RHR Discharge to LOOP B (721), RCS Letdown isolation AOV (427), LOOP B Hot Leg Sample Isolation AOV (955), and RCP Seal Outlet AOV (270B).

**Non-Power Ops Pinch Point Area:** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

**Fire Protection**

Suppression System(s):

- No fixed suppression systems have been provided
- Hose stations are available in this zone

Detection Systems(s):

- Z14 thermistor detectors provide detection protection around the Reactor Coolant Pump A

**Design Features**

| |
|---|
| Boundaries: Shown on drawings 33013-2928 sheets 5, 6, and 7. |

Doors: None

Dampers: None

Special Provisions: None

**Combustible Loading**

Floor Area = 880 sq. ft.
Equivalent Fire Severity Classification: LOW (<60,000 BTU/ft$^2$)
Major Combustibles: Cables

**Potential Hazards**

- Oil from RCP misting

**NRC Approval from NFPA 805 Chapter 3 Requirement**

- For the potential of oil misting from the Reactor Coolant pumps due to normal motor consumption not captured by the oil collection system (NFPA 805 Chapter 3, section 3.3.12 (1)).

**Engineering Evaluations**

- None

## Reactor Containment Building
## Pressurizer

**Fire Area RC**

**Fire Zone T-PRZR**

**Elevation: 274'-6"**

**Safe Shutdown Equipment (SSE) in Area:** Yes

**Major SSE in fire zone** (Reference 3.18):

N2 Arming SOV for PORV 430 (8619A), N2 Arming SOV for PORV 431C (8619B), PORV 430 Actuation SOV (8620A), PORV 431C Actuation SOV (8620B), Pressurizer (PZR) Sample AOV (951), Pressurizer Water Sample AOV (953), PORV AOV (430) and associated block valve MOV (516), PZR Spray Valves (431A and 431B), PORV AOV (431C) and associated block valve (515), PZR Safety Valves (434 and 435), PZR Proportional Heaters (EHTRRC01A and EHTRRC02A), and PZR Backup Heaters (EHTRRC01B and EHTRRC02B).

**Non-Power Ops Pinch Point Area:** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

**Fire Protection**

Suppression System(s):

- No fixed suppression systems have been provided
- Hose stations are available in this zone

Detection Systems(s):

- Z16D1X smoke detector

**Design Features**

| |
|---|
| Boundaries: Shown on drawings 33013-2928 sheets 5, 6, and 7. |

Doors: None

Dampers: None

Special Provisions: None

**Combustible Loading**

Floor Area = 138 sq. ft.
Equivalent Fire Severity Classification: LOW (<60,000 BTU/ft$^2$)
Major Combustibles: N/A

**Potential Hazards**

- None

**NRC Approval from NFPA 805 Chapter 3 Requirement**

- None

**Engineering Evaluations**

- None

## Reactor Containment Building
## Reactor

**Fire Area RC**

**Fire Zone T-REACTOR**

**Elevation: 253'-3"**

**Safe Shutdown Equipment (SSE) in Area:** Yes

**Major SSE in fire zone** (Reference 3.18):

Reactor Head Vent Outer SOVs (590 and 591), and Reactor Head Vent Inner SOVs (592 and 593).

**Non-Power Ops Pinch Point Area:** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

**Fire Protection**

Suppression System(s):

- No fixed suppression systems have been provided
- Hose stations are available in this zone

Detection Systems(s):

- No fire detection systems have been provided.

**Design Features**

| Boundaries: Shown on drawings 33013-2928 sheets 5, 6, and 7. |
|---|

Doors: None

Dampers: None

Special Provisions: None

## Combustible Loading

Floor Area = 1166 sq. ft.
Equivalent Fire Severity Classification: LOW (<60,000 BTU/$ft^2$)
Major Combustibles: Rubber and cables

## Potential Hazards

- None

## NRC Approval from NFPA 805 Chapter 3 Requirement

- None

## Engineering Evaluations

- None

## 7.12 Fire Area SAF

The Standby Auxiliary Feedwater Pump Building (SAF) is located on the southeast corner of the plant complex. It is a single story structure that consists of two main sections. The first section is the existing east side where the SAFW pumps are located. The second section is the new west side that houses a diesel generator, associated load center, and various FLEX equipment. The wall between the SAF and the Auxiliary Building exceeds the requirements for a 3-hour fire barrier. All other sides of the SAF are exposed to the exterior. The roof of the building is reinforced concrete.

The SAF houses the standby auxiliary feedwater pumps, pump controls, ventiliaiton equipment, a condensate storage tank, a 1-MW diesel generator and associated fuel, load center, and various FLEX equipment. For the purposes of the fire hazards analysis, the building was considered to be a single fire area. It should be noted that a separate metal building is installed south of the SAFW Building and contains Hydrogen compressed gas cylinders for primary plant systems. Additionally, a large water tank was added on the west side of the SAF.

## Standby Auxiliary Feedwater Pump Building

**Fire Area SAF**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

SAFW Pump C (PSF01A), SAFW Pump D (PSF01B), SAFW Pump C discharge flow transmitter (FT-4084), SAFW Pump D discharge flow transmitter (FT-4085), SAFW Pump Room Cooling Unit A/B (AFF01A/AFF01B), SAFW Pump C/D suction MOVs (9629A/B), SAFW Pump C/D discharge MOVs (9701A/B), SAFW Pump Cross, SAFW Pump Cross Over MOVs (9703A and 9703B), SAFW Pump D discharge MOV (9746), SAFW alternative cooling supply from fire water hose connection valve (8549A), SAFW Pump C/D Instrument Panels (SAFWPCIP/SAFWPDIP), and SAFW Room A/B Cooler Flow control valves (9632A/9632B), Alternate RCS Injection Pump (PCH02), SAFW Diesel Generator (KDG08), AC Power Distribution Panel (ACPDPAF07), Motor Starter for Alternate RCS Injection Pump (43/PCH02), Manual Transfer Switch for PSF01A/B (43/PSF01A and 43/PSF01B), breakers 52D1/SAFW, 52D4/SAFW, 52G1/SAFW, and 52G2/NFPA), SAFW Emergency Generator Paralleling Swith Gear (SAFWSWGR), Alt RCS Inj NFPA 805 Transfer Pump A (PBD07A), Alt RCS Inj NFPA 805 Transfer Pump B (PBD07B), and the Alt RCS Inj Pump Recirc Cooler (EBD02).

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None.

**Fire Protection**

Suppression System(s)

- S52 fire suppression system is provided in the diesel generator area only.
- Portable fire extinguishers are available in this area/zone.
- Yard hydrant connection could be used if needed as well as the alternate cooling water supply in the building which is connected to the yard loop system.

Detection System(s)

- S52 smoke and heat detectors provide detection protection in the area.

## Design Features

| Main Section: | |
|---|---|
| Ceiling: | Non-rated minimum 12” poured reinforced concrete to exterior. |
| Floor: | Non-rated minimum 12” poured reinforced concrete to grade. |
| North Boundary: | 3 hour rated to Auxiliary Building (Fire Area ABI/Fire Zone ABO). |
| South Boundary: | 3 hour rated minimum poured concrete, exposure to Primary Hydrogen Storage Building. |
| Southeast Boundary: | Non-rated over 24” thick reinforced poured concrete to Hydrogen Storage Building. |
| East Boundary: | 3 hour rated minimum poured concrete, exposure to Primary Hydrogen Storage Building. |
| West Boundary: | Non-rated minimum 12” poured reinforced concrete to SAFW Annex Section. |

| Annex Section: | |
|---|---|
| Ceiling: | Non-rated minimum poured reinforced concrete to exterior. |
| Floor: | Non-rated minimum poured reinforced concrete to grade. |
| North Boundary: | Non-rated reinforced concrete to exterior. |
| South Boundary: | Non-rated minimum poured reinforced concrete to exterior. |
| East Boundary: | 3 hour rated poured reinforced concrete To SAFW Main Section. |
| West Boundary: | Non-rated reinforced concrete to water storage tank area. |
| Interior DG Room Walls | 3 hour rated poured reinforced concrete. |

Doors

- 3 hour rated single leaf door (SD/63) between the SAFW Main and Annex Section
- 3 hour rated single leaf door between the SAFW Annex Section and Diesel Generator Area
- 3 hour rated single roll door between the SAFW Annex Section and Diesel Generator Area

Dampers

- None

Special Provisions

- Hose can be attached to the Standby Auxiliary Feedwater Alternate Cooling Water Connection for suppression activities or a yard loop hydrant if needed.

## Combustible Loading

Floor Area = 2,473 $ft^2$

Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Cable Insulation, Lube Oil, Diesel Fuel

## Potential Hazards

- Electrical - Potential for grounds on 480V buses

## NRC Approvals from NFPA 805 Chapter 3 Requirements

- None

## Engineering Evaluations

- ME Calc. No. 92-0006, Rev. 0, Analysis of Pen's and Fire Barriers: Standby Auxiliary Feedwater and Auxiliary Building Interface, dated 2/28/92
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-2002-005, Primary and Secondary Hydrogen Storage Buildings NFPA 50A Code Review, Rev. 0, dated 2/25/02
- DA-ME-13-018, Rev. 001, S52 Hydraulic Calculation – SAFW Annex Suppression System

## 7.13 Fire Area SH

The screen house is located on the north side of the plant on the edge of Lake Ontario and is separated from the rest of the plant buildings by a minimum of 55 feet of open space. It is a two floor structure which houses the circulating water equipment (pumps, traveling screens, chlorinator), service water pumps, fire pumps, plant auxiliary boiler, and 480-volt switchgear which supplies power to the above equipment. The screen house is considered to be one fire area. For purposes of the fire hazards analysis, the building has been divided into three fire zones, the basement, the operating floor and the circulating water pump area.

| | |
|---|---|
| Zone SH-1 | Basement, Elevations 239'-6" & 243'-6" |
| Zone SH-2 | Operating Floor, Elevation 253'-6" |
| Zone SH-3 | Circulating Water Pump Area, Elevation 237'-0" |

The majority of the Operating Floor is separated from the remaining two zones by reinforced concrete floor with open stairwells between them and an open grating over the Circulating Water Pump Area. All other openings in the floor are sealed. The screen house basement is constructed of reinforced concrete. The floor consists of two levels, one at elevation 239'-6" and one at elevation 243'-6". The only safe shutdown related equipment in the basement is cabling associated with the service water pumps and the power cable from the main plant buildings. The power cable runs in underground ducts, enters the screen house at two separate locations and then runs through cable trays to locations below the switchgear. Redundant cable trays are separated by approximately 23 feet at the point of entry into the screen house and by approximately 1 foot below the switchgear. Power cables from the switchgear to the pumps run in individual conduits. The cables to the service water pumps are separated by their conduits and an air gap. The air gap varies from a few inches in some locations to several feet in others.

The Circulating Water Pump Area is constructed of reinforced concrete and consists of one level at elevation 237'-0". The area houses the lower portions of circulating water pumps A and B with the remainder of the pumps extending into the Operating Floor (Fire Zone SH-2) through the metal grating that forms the ceiling of the zone. The circulating water pumps are provided with oil filled capacitors. No other equipment or combustibles are present in the fire zone.

The screen house main floor is enclosed by a steel frame structure with metal siding. The roof is a metal deck supported by unprotected steel. The roof covering consists of a 2 ply, 15 pound asphalt felt vapor barrier, a solvent base adhesive (application rate of 200 $ft^2$/gal), noncombustible foam glass insulation and glass woven fabric covered with a built up tar and gravel roof. The roof assembly is not Factory Mutual Class I construction. Also located within this fire zone are the two plant fire pumps and associated piping. One pump is electric motor driven the other is diesel engine driven.

## Screen House Building Basement

**Fire Area SH**

**Fire Zone SH-1**

**Elevations 239'-6" & 243'-6"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Sodium Hypochlorite Pumps

### Fire Protection

Suppression System(s)

- S17 is an automatic deluge suppression system which provides suppression protection over the cable trays in the area.
- Portable fire extinguishers are available in this zone.
- Hose Reel 31 on the Operating Floor (fire zone SH-2) has adequate length of hose to fight a fire in this area and exterior yard hydrant line could also be utilized in the northern most areas of this building.

Detection System(s)

- S17 smoke detectors actuate suppression system S17.
- No fixed detection systems have been provided in the zone other than those which actuate suppression system S17.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated poured concrete to Operating Floor (Fire Area SH/Fire Zone SH-2) |
| Floor: | Non-rated poured concrete to grade. |
| North Boundary: | Non-rated poured concrete to grade. |
| South Boundary: | Non-rated poured concrete to grade. |
| East Boundary: | Non-rated poured concrete to grade. |

| Boundaries | |
|---|---|
| West Boundary: | Non-rated poured concrete to grade. |

Doors

- None

Dampers

- None

Special Provisions

- Gas supply line for House Heating Steam Boiler can be isolated at multiple locations

**Combustible Loading**

Floor Area = 2,640 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Lube Oil, Cable Insulation, CPVC, Polypropylene

**Potential Hazards**

- There are 4kv and 480 volt power lines in the cable trays and by penetration areas at the bottom of the stairs in the southeast corner of the fire area.
- Natural gas line runs in the northern section of this fire area. Valves 7229B and 7229C or 7229A at the Regulating Station (outside) east side and remote from the Screenhouse will isolate this line.
- Sodium Hypochlorite Pumps present a health hazard. This area is diked to control spills.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- Refer to Volume 2 Appendix A commitments concerning compliance with NFPA 85 requirements.

- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## Screen House Building Operating Floor

**Fire Area SH**

**Fire Zone SH-2**

**Elevation 253'-6"**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)

Service Water Pumps A/B/C/D (PSW01A/PSW01B/PSW01C/PSW01D), Screen House DC Distribution Panel A/B (DCPDPSH01A/B), EDG A Supply to BUS 18 (52/EG1A2), EDG B Supply to BUS 17 (52/EG1B2), Breaker for BUS 17 Supply (52/17), Breaker for BUS 18 Supply (52/18), Breaker for BUS 17 to BUS 18 tie (52/BT17-18), Breaker for Circ Water Intake Heaters A/B/C/D (52/IH1A, 52/IH1B, 52/IH1C, and 52/IH1D), Motor Control Center G Supply (52/MCC1G1 and 52/MCC1G2), BUS17, BUS18, Screen House SW MOVs (4609 and 4780), and breaker for Motor driven fire pump (52/FP).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Circulating Water Pumps A and B, Motor Driven Fire Pump and controller, Diesel Fire Pump and controller, House Heating Boiler, MCC G, and Traveling Screens.

**Fire Protection**

Suppression System(s)

- S18 is an automatic sprinkler system which provides suppression protection for the service water pump area and fire pump area and is fed by the yard loop fire water system.
- Portable fire extinguishers are available in this zone.
- A hose station is available in this zone.
- Exterior yard hydrant lines are available for use for manual fire fighting capability.

Detection System(s)

- Z26 smoke detectors provide detection protection for the service water pump, fire water pump, and switchgear area.

## Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated sheet metal siding to exterior. |
| Floor: | Non-rated poured concrete to Screenhouse basement (Fire Area SH/ Fire Zone SH-1)<br>Non-rated poured concrete and non-rated open steel grating to Circulating Water Pump Area (Fire Area SH/Fire Zone SH-3) |
| North Boundary: | Non-rated sheet metal siding to exterior. |
| South Boundary: | Non-rated sheet metal siding to exterior. |
| East Boundary: | Non-rated sheet metal siding to exterior. |
| West Boundary: | Non-rated sheet metal siding to exterior. |

Doors

- None

Dampers

- None

Special Provisions

- A curb has been installed around the diesel fire pump and the diesel oil storage tank to prevent spread of flammable liquid. The curbed area is equipped with a floor drain which drains to a holding tank buried outside the screen house.
- A large overhead door is located in the south wall and roof exhaust fans can be used for smoke removal, if needed.
- Curbs are provided to prevent water and flammable liquids from flowing into the basement area below the service water pumps.
- Gas supply line for the House Heating Steam Boiler can be isolated in multiple locations.
- Gas supply line for the two salamanders is provided with an excess flow check valve at the outdoor south wall meter station.

## Combustible Loading

Floor Area = 9,645 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Diesel Fuel, Lube Oil, Cable Insulation, Battery Cases, Grease

## Potential Hazards

- Circulating Water Pump motors are 4kv motors.

- Traveling Screens have 480 volt motors located on top.
- There is a 2" natural gas line which runs in between the Circulating Water Pumps to supply the two salamanders that are typically utilized in cold weather months. Valve 7241 at the south exterior meter station will isolate this line, if needed.
- There is a 4" natural gas line just east of the house heating boiler. Valves 7229B and 7229C or 7229A at the Regulating Station (outside east end) will isolate this line, if needed.
- Service Water Pump motors and Motor Driven Fire pump motors are 480 volts.
- 4kv/480 volt transformers are in the north and south end of Bus 17 and 18 respectively.
- 480 volt cables in the Cable Trays and to MCC G.
- 275 gallon Diesel Fuel Tank is located in this area. Should a spill occur it will be contained in the diked area and drained to 290 gallon underground storage tank via two floor drains that are provided in the diked area.
- The battery casing may be ruptured by a fire in this area releasing Hydrogen Gas and Sulfuric Acid. Provide proper ventilation of the area to prevent Hydrogen build up.
- Sodium Hypochlorite Tank is located outside northeast of the Screenhouse. This area is diked to contain any spills.

**<u>NRC Approvals from NFPA 805 Chapter 3 Requirements</u>**

- For the use of (2) portable natural gas heaters in the Screenhouse (NFPA 805 Chapter 3, section 3.3.1.3.4).

- For the use of the fire protection water system to furnish water to the traveling screen spray wash system (NFPA 805 Chapter 3, section 3.5.16).

**<u>Engineering Evaluations</u>**

- DA-ME-93-108, Rev. 0, Diesel Fire Pump Fuel Consumption Calculations, dated 8/27/93
- DA-ME-95-149, Rev. 0, Evaluation of Fuel Oil Supply Piping for Diesel Fire Pump KFP01, dated 12/20/95
- DA-CE-95-161, Rev. 1, Diesel Fire Pump Control Panel Anchorage, dated 1/11/96
- EWR 3323, Reduction of Fire Hazard in the Vicinity of the Diesel Driven Fire Pump
- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- Refer to Volume 2 Appendix A commitments concerning compliance with NFPA 85 requirements.
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## Screen House Building Circulating Water Pump Area

**Fire Area SH**

**Fire Zone SH-3**

**Elevations 237'-0"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Circulating Water Pumps A and B.

### Fire Protection

Suppression System(s)

- No fixed suppression systems have been provided.
- Portable fire extinguishers are available on the Operating Floor .
- Hose Reel 31 is available on the Operating Floor.
- Yard loop hydrants are available for additional capability.

Detection System(s)

- No fixed detection systems have been provided in the zone.

### Design Features

| Boundaries | |
|---|---|
| Ceiling: | Non-rated poured concrete and non-rated open steel grating to Operating Floor (Fire Area SH/Fire Zone SH-2) |
| Floor: | Non-rated poured concrete to grade. |
| North Boundary: | Non-rated poured concrete to grade. |
| South Boundary: | Non-rated poured concrete to grade. |
| East Boundary: | Non-rated poured concrete to grade. |
| West Boundary: | Non-rated poured concrete to grade. |

Doors

- None

Dampers

- None

Special Provisions

- 2" natural gas line for the salamanders is provided with an excess flow check valve at the outdoor south wall meter station

**Combustible Loading**

Floor Area = 1360 $ft^2$
Equivalent Fire Severity Classification: LOW (< 60,000 BTU/$ft^2$)
Major Combustibles: Fiberglass Ladders, Oil

**Potential Hazards**

- Circulating Water Pump motors are 4kv motors.
- A Circulating Water Pump lube oil spill from above may result in lube oil accumulation in the area.
- A 2" natural gas line is routed in this area to feed portable salamander heaters and is isolatable from the meter station using valve 7241 which is located on the exterior south wall, if needed.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-2000-052, Fire Detection System Evaluation, Rev. 0, dated 9/6/00
- DA-ME-13-001, Rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

## 7.14 Fire Area WS

Fire Area WS is the Contaminated Storage Building. The Contaminated Storage Building is a separate fire area situated away from the Auxiliary Building and connected by a corridor. The building is used for the storage of miscellaneous equipment. The area does not contain equipment associated with safe shutdown. An automatic suppression system has been provided in the area and the adjoining corridor.

## Contaminated Storage Building

**Fire Area WS**

**Elevation 271'-0"**

**Safe Shutdown Equipment (SSE) in Area?** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area?** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

**Fire Protection**

Suppression System(s)

- An automatic suppression system provides suppression protection for the entire Contaminated Storage Building and the adjoining corridor to the Auxiliary Building. System is fed from the yard loop fire water system.
- Portable fire extinguishers are available in this area.
- Yard loop exterior hydrants are available.

**Design Features**

| Boundaries | |
|---|---|
| Ceiling: | Non-rated to exterior. |
| Floor: | Non-rated to grade. |
| North Boundary: | 2 hour rated to Auxiliary Building Operating Floor (Fire Area ABI/ Fire Zone ABO)<br>Non-rated to exterior. |
| South Boundary: | Non-rated to exterior. |
| East Boundary: | Non-rated to exterior. |
| West Boundary: | 3 hour rated to Canister Preparation Building (Fire Area ABI, Zone CPB) |

Doors

- S29F (active leaf) and S29F-l (inactive leaf) - 3 hour rated double fire door in north wall of corridor to Auxiliary Building (Fire Area ABI/Fire Zone ABO).

Dampers

- None

Special Provisions

- Wye connection is provided on the East wall for Fire Department connection

**Combustible Loading**

Floor Area = 3650 $ft^2$
Equivalent Fire Severity Classification: LOW (0 BTU/$ft^2$ to less than 60,000 BTU/$ft^2$)
Major Combustibles: Plastics, rubber, PVC, trash

**Potential Hazards**

- Building is designed with rack storage which could make fighting a fire difficult
- Various compressed gas cylinders
- Flammable liquid storage lockers

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-95-058, Rev. 0, Contaminated Storage Building and Hot Shop Sprinkler Systems Actuation Evaluation, dated 1/18/95
- Appendix R/Fire Protection conformance verification checklist for PCR 2005-0051, Revision 0.

## 7.15 Fire Area YARD

Fire Area Yard includes the Transformer Yard General Area adjacent to the Control and Turbine Buildings. The Main Transformer, Station Unit Transformer #11, Station Auxiliary Transformer 12A and Station Auxiliary Transformer 12B are all located in this general area.

## Transformer Yard General Area

### Fire Area YARD

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18):

Breaker for BUS12B supply from SAT 12A (52/12AX), Breaker for BUS12A supply from SAT 12A (52/12AY), Breaker for BUS12B supply from SAT 12B (52/12BX), and Breaker for BUS12A supply from SAT 12B (52/12BY).

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Main Transformer, Station Unit Transformer #11, Station Auxiliary Transformer 12A, and Station Auxiliary Transformer 12B.

**Fire Protection**

Suppression System(s)

- S20 is an automatic deluge suppression system which provides suppression protection for the Main Transformer.
- S21 is an automatic deluge suppression system which provides suppression protection for the Station Unit Transformer #11
- S22 is an automatic deluge suppression system which provides suppression protection for Station Auxiliary Transformer 12A
- S23 is an automatic deluge suppression system which provides suppression protection for Station Auxiliary Transformer 12B
- Portable fire extinguishers are available in this area/zone
- Yard loop hydrants are available for manual suppression activities

Detection System(s)

- S20 rate of rise heat detectors actuate suppression system S20.
- S21 rate of rise heat detectors actuate suppression system S21.
- S22 rate of rise heat detectors actuate suppression system S22.
- S23 rate of rise heat detectors actuate suppression system S23.

## Design Features

Boundaries

3 hour fire separation is provided between the Main Transformer and the Station Unit Transformer #11

3 hour fire separation is provided between the Main Transformer and the Control Building

3 hour fire separation is provided between Station Unit Transformer #11 and Station Auxiliary Transformer 12A

3 hour fire separation is provided between Station Auxiliary Transformer 12A and Control building

3 hour fire separation is provided between circuit 767 and circuit 751

Partial 3 hour fire separation is provided between the immediate area of the Main Transformer and the Turbine Building Intermediate Floor.

Doors

- F608 - 3 hour rated rolling fire door in the wall which separates the Station Auxiliary Transformers 12A and 12B (Normally kept Closed)

Dampers

- None

Special Provisions

- Hydrant #12, which is located on the southeast side of the Plant, is specifically set up for a fire in the Transformer Yard. Master Stream appliance is also available for use.
- Hose cabinet #4 contains hose and fire fighting equipment.
- Area of transformers is provided with a drainage system to the collection pond located to the south of the Nuclear Assessment Building.

## Combustible Loading

Floor Area = N/A
Equivalent Fire Severity Classification: N/A
Major Combustibles: Oil

## Potential Hazards

- There are Nitrogen compressed gas bottles located near the transformers and caution should be exercised as these pose a missile hazard.
- Extreme caution should be exercised if entry is required due to the electrical hazards.
- Oil and water suppression overflow will be into the pond south of the Nuclear Assessment

Building.

- 115 KV oil filled underground ducts go to Station 13A. The pumps keep the system presurized and can be shut off at Station 13A.
- Cryogenic liquid nitrogen dewars are located near the transformer yard.
- Spare main transformer is located east of the yard area.

**NRC Approvals from NFPA 805 Chapter 3 Requirements**

- None

**Engineering Evaluations**

- DA-ME-94-082, Rev. 0, Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution, dated 5/1/95

# 7.16 Fire Area PROTECTED AREA

The PROTECTED Area includes four quadrants within the protected area of the plant. The PROTECTED Area includes four zones: Zone PA-NE, Zone PA-NW, Zone PA-SE, and Zone PA-SW. This Fire Area and associated zones were developed for Fire PRA purposes only and is shown on drawing 33013-2928, 21.

## Protected Area

**Fire Area PA**

**Fire Zone PA-NE**

**Elevation: Grade**

**Safe Shutdown Equipment (SSE) in Area?** Yes

**Major SSE in fire zone** (Reference 3.18)
Breakers 52/12AX, 52/12AY, 52/12BX, and 52/12BY.

**Non-Power Ops Pinch Point Area?** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** Diesel Air Compressor (outside unit) for back up service air/instrument air.

**Fire Protection**

Suppression System(s): None

Detection Systems(s): None

**Design Features**

Boundaries: See drawing 33013-2928,21.
Doors: N/A
Dampers: N/A
Special Provisions: None

**Combustible Loading**

Floor Area = N/A
Equivalent Fire Severity Classification: N/A
Major Combustibles: None

**Potential Hazards**

- Weather

**NRC Approval from NFPA 805 Chapter 3 Requirement**

- None

**Engineering Evaluations**

- None

## Protected Area

**Fire Area PA**

**Fire Zone PA-NW**

**Elevation: Grade**

**Safe Shutdown Equipment (SSE) in Area:** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area:** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

**Fire Protection**

Suppression System(s): None

Detection Systems(s): None

**Design Features**

Boundaries: See drawing 33013-2928,21
Doors: N/A
Dampers: N/A
Special Provisions: None

**Combustible Loading**
Floor Area = N/A
Equivalent Fire Severity Classification: N/A
Major Combustibles: None

**Potential Hazards**
- Weather

**NRC Approval from NFPA 805 Chapter 3 Requirement**

- None

**Engineering Evaluations**

- None

## Protected Area

**Fire Area PA**

**Fire Zone PA-SE**

**Elevation: Grade**

**Safe Shutdown Equipment (SSE) in Area:** Yes

**Major SSE in fire zone** (Reference 3.18):
NFPA (805) Diesel Generator (KDG09)

**Non-Power Ops Pinch Point Area:** No (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

### Fire Protection

Suppression System(s): S53 Suppression System (FM-200) for NFPA D/G Enclosure

Detection Systems(s): Heat Detection for NFPA D/G Enclosure

### Design Features

Boundaries: See drawing 33013-2928,21
Doors: N/A
Dampers: N/A
Special Provisions: None

### Combustible Loading

Floor Area = N/A
Equivalent Fire Severity Classification: N/A
Major Combustibles: None

### Potential Hazards

- Weather

### NRC Approval from NFPA 805 Chapter 3 Requirement

- None

### Engineering Evaluations

- None

## Protected Area

**Fire Area PA**

**Fire Zone PA-SW**

**Elevation: Grade**

**Safe Shutdown Equipment (SSE) in Area:** No

**Major SSE in fire zone** (Reference 3.18): None

**Non-Power Ops Pinch Point Area:** Yes (Reference 3.18)

**Major Non-Safe Shutdown Related equipment:** None

**Fire Protection**

Suppression System(s): None

Detection Systems(s): None

**Design Features**

Boundaries: See drawing 33013-2928,21
Doors: N/A
Dampers: N/A
Special Provisions: None

**Combustible Loading**
Floor Area = N/A
Equivalent Fire Severity Classification: N/A
Major Combustibles: None

**Potential Hazards**
- Weather

**NRC Approval from NFPA 805 Chapter 3 Requirement**
- None

**Engineering Evaluations**
- None

# 8.0 FHA Tables

# Table 8-1
# FIRE DAMPERS

| DAMPER IDENTIFICATION(1) | FROM: Fire Area/Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | HVAC SYSTEM | DAMPER LOCATION(3) |
|---|---|---|---|---|---|
| A - 21 | ABI/ABO | ABBM/ABM | 271'-0" | 1G FAN FILTER SYSTEM EXHAUST | FLOOR |
| A - 119 | ABI/ABO | ABBM/ABM | 271'-0" | 1G FAN FILTER SYSTEM SUCTION | FLOOR |
| AH - 39 | BOP/TB-1 | CC/AHR | 253'-6" | BATTERY ROOMS A/C RETURN | SOUTH WALL |
| AH - 44 | BOP/TB-1 | CC/AHR | 253'-6" | CONTROL BUILDING VENTILATION RM OUTSIDE AIR INTAKE | SOUTH WALL |
| AH - 53 | BOP/TB-1 | CC/AHR | 253'-6" | CONTROL BUILDING TO TURBINE BUILDING TRANSFER | SOUTH WALL |
| BA - 28 | BOP/TB-1 | BR1A | 253'-6" | BATTERY RM "A" EXHAUST | SOUTH WALL |
| BA - 33 | CC/AHR | BR1A | 253'-6" | CONTROL BUILDING VENTILATION RM TO BATT. RM. "A" VENT. | EAST WALL |
| BA - 38 | CC/AHR | BR1A | 253'-6" | BATTERY ROOMS A/C SUPPLY | EAST WALL |
| BB - 37 | BOP/TB-1 | BR1B | 253'-6" | BATTERY RM "B" EXHAUST | SOUTH WALL |
| BB - 46 | BR1A | BR1B | 253'-6" | BATT. RM. "A" TO BATT. RM. "B" VENT | EAST WALL |
| BB - 47 | BR1A | BR1B | 253'-6" | BATTERY RM "B" A/C SUPPLY | EAST WALL |
| CP - 3 | CHG | ABBM/ABB | 235'-8" | CHARGING PUMP RM EXHAUST | SOUTH WALL |
| CP - 4 | CHG | ABBM/ABB | 235'-8" | IG FAN FILTER SYSTEM EXHAUST | SOUTH WALL |
| CP - 10 - 1 | CHG | ABBM/ABB | 235'-8" | CHARGING PUMP RM COOLING UNITS A AND B RETURN | SOUTH WALL |

| DAMPER IDENTIFICATION(1) | FROM: Fire Area /Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | HVAC SYSTEM | DAMPER LOCATION(3) |
|---|---|---|---|---|---|
| CP - 10 - 2 | CHG | ABBM/ABB | 235'-8" | CHARGING PUMP RM COOLING UNITS A AND B RETURN | SOUTH WALL |
| CP - 10 - 3 | CHG | ABBM/ABB | 235'-8" | CHARGING PUMP RM COOLING UNITS A AND B RETURN | SOUTH WALL |
| CP - 10 - 4 | CHG | ABBM/ABB | 235'-8" | CHARGING PUMP RM COOLING UNITS A AND B RETURN | SOUTH WALL |
| CP - 12 | CHG | ABBM/ABB | 235'-8" | 1G FAN FILTER SYSTEM EXHAUST | WEST WALL |
| CP - 13 | CHG | ABBM/ABB | 235'-8" | CHARGING PUMP RM COOLING UNIT A SUPPLY | WEST WALL |
| CP - 13A | CHG | ABBM/ABB | 235'-8" | CHARGING PUMP RM COOLING UNIT B SUPPLY | WEST WALL |
| CP - 31 | CHG | ABBM/ABB | 235'-8" | SEAL RETURN FILTER RM EXHAUST | SOUTH WALL |
| CR - 147 | CC/CR | CC/CR | 289'-6" | CONTROL RM KITCHEN SUPPLY | CEILING |
| I - 27 | ABI/IBS-1 | BOP/SB-1WT | 253'-6" | SERVICE BUILDING TO CON-TROLLED ACCESS AREA EXHAUST SYSTEM | WEST WALL |
| I - 317 | ABI/IBS-3 | ABI/ABO | 293'-0" | DECON PIT EXHAUST | SOUTH WALL |
| I - 318 - 1 | ABI/IBS-3 | ABI/ABO | 293'-0" | AUXILIARY BUILDING EXHAUST(1G FAN DISCHARGE) | EAST WALL |
| I - 318 - 2 | ABI/IBS-3 | ABI/ABO | 293'-0" | AUXILIARY BUILDING EXHAUST(1G FAN DISCHARGE) | EAST WALL |
| I - 318 - 3 | ABI/IBS-3 | ABI/ABO | 293'-0" | AUXILIARY BUILDING EXHAUST(1G FAN DISCHARGE) | EAST WALL |
| I - 318 - 4 | ABI/IBS-3 | ABI/ABO | 293'-0" | AUXILIARY BUILDING EXHAUST(1G FAN DISCHARGE) | EAST WALL |
| I - 340 - 1 | ABI/IBS-2 | BOP/SB-2 | 271'-0" | NUCLEAR SAMPLE RM SUPPLY | WEST WALL |

| DAMPER IDENTIFICATION(1) | FROM: Fire Area /Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | HVAC SYSTEM | DAMPER LOCATION(3) |
|---|---|---|---|---|---|
| I - 340 - 2 | ABI/IBS-2 | BOP/SB-2 | 271'-0" | NUCLEAR SAMPLE RM EXHAUST | WEST WALL |
| I - 350 - 1 | ABI/IBN-2 | BOP/SB-2 | 278'-4" | LAUNDRY RM EXHAUST | WEST WALL |
| I - 350 - 2 | ABI/IBN-2 | BOP/SB-2 | 278'-4" | LAUNDRY RM EXHAUST | WEST WALL |
| I - 411 - 1 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 - 2 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 - 3 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 - 4 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 - 5 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 - 6 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 - 7 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 - 8 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 - 9 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 -10 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP FILTER UPPER BANK EXHAUST | SOUTH WALL |
| I - 411 -11 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -12 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |

| DAMPER IDENTIFICATION(1) | FROM: Fire Area /Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | HVAC SYSTEM | DAMPER LOCATION(3) |
|---|---|---|---|---|---|
| I - 411 -13 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -14 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -15 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -16 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -17 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -18 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -19 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -20 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| I - 411 -21 | ABI/IBS-2 | ABI/ABO | 278'-4" | SFP CHAR. FILTER LOWER BANK EXHAUST | SOUTH WALL |
| RR - 117 | CC/RR | CC/RR | 271'-0" | MULTIPLEXER RM A/C RETURN (Removed under PCR 96-125) Wall opening closed with masonry materials.(4) | SOUTH WALL, MUX ROOM |
| RR - 120 EIN Deactivate/Fire Zones Combined under PCR 96-125 See CR-2007-005750 | CC/RR | CC/RR | 271'-0" | MULTIPLEXER RM A/C SUPPLY | SOUTH WALL, MUX ROOM |
| RR - 121 EIN Deactivate/Fire Zones Combined under PCR 96-125 See CR-2007-005750 | CC/RR | CC/RR | 271'-0" | MULTIPLEXER RM A/C SUPPLY | SOUTH WALL, MUX ROOM |

| DAMPER IDENTIFICATION(1) | FROM: Fire Area /Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | HVAC SYSTEM | DAMPER LOCATION(3) |
|---|---|---|---|---|---|
| RR - 122<br>EIN Deactivate/Fire Zones Combined under PCR 96-125<br>See CR-2007-005750 | CC/RR | CC/RR | 271'-0" | MULTIPLEXER RM A/C SUPPLY | SOUTH WALL, MUX ROOM |
| RR - 123<br>EIN Deactivate/Fire Zones Combined under PCR 96-125<br>See CR-2007-005750 | CC/RR | CC/RR | 271'-0" | MULTIPLEXER RM A/C SUPPLY | SOUTH WALL, MUX ROOM |
| SAS - 190 | BOP/TSC-1N | BOP/TSC-1N | 271'-0" | SUPPLY AIR TO OPERATIONAL SUPPORT CENTER AREA | SOUTH WALL |
| SAS - 192 | BOP/TSC-1N | BOP/TSC-1N | 271'-0" | OPERATIONAL SUPPORT CENTER TO TSC CLG RA TRANSFER GRILLE | SOUTH WALL |
| TBE - 24- 1 | BOP/TB-1 | BOP/AVT | 253'-6" | AVT/INSTRUMENT AIR COMPRESSOR AREA O.A. SUPPLY | EAST WALL |
| TBE - 24- 2 | BOP/TB-1 | BOP/AVT | 253'-6" | AVT/INSTRUMENT AIR COMPRESSOR AREA O.A. SUPPLY | EAST WALL |
| TBE - 24- 3 | BOP/TB-1 | BOP/AVT | 253'-6" | AVT/INSTRUMENT AIR COMPRESSOR AREA O.A. SUPPLY | EAST WALL |
| TBE - 24- 4 | BOP/TB-1 | BOP/AVT | 253'-6" | AVT/INSTRUMENT AIR COMPRESSOR AREA O.A. SUPPLY | EAST WALL |
| TBW - 2 - 1 | BOP/SB-2 | BOP/TB-2 | 271'-0" | SERVICE BUILDING ADDITION RA DUCT | EAST WALL |
| TBW - 2 - 2 | BOP/SB-2 | BOP/TB-2 | 271'-0" | SERVICE BUILDING ADDITION RA DUCT | EAST WALL |
| TBW - 2 - 3 | BOP/SB-2 | BOP/TB-2 | 271'-0" | SERVICE BUILDING ADDITION RA DUCT | EAST WALL |
| TBW - 3 | BOP/SB-2 | BOP/TB-2 | 271'-0" | HVAC SUPPLY DUCT TO SERVICE BUILDING ADDITION ZONE 1 | EAST WALL |
| TBW - 3A | BOP/SB-2 | BOP/TB-2 | 271'-0" | HVAC SUPPLY DUCT TO SERVICE BUILDING ADDITION ZONE 2 | EAST WALL |

| DAMPER IDENTIFICATION(1) | FROM: Fire Area /Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | HVAC SYSTEM | DAMPER LOCATION(3) |
|---|---|---|---|---|---|
| TBW - 3B | BOP/SB-2 | BOP/TB-2 | 271'-0" | HVAC SUPPLY DUCT TO SERVICE BUILDING ADDITION ZONE 3 | EAST WALL |
| TBW - 3C | BOP/SB-2 | BOP/TB-2 | 271'-0" | HVAC SUPPLY DUCT TO SERVICE BUILDING ADDITION ZONE 4 | EAST WALL |
| TBW - 3D | BOP/SB-2 | BOP/TB-2 | 271'-0" | HVAC SUPPLY DUCT TO SERVICE BUILDING ADDITION ZONE 5 | EAST WALL |
| TBW - 3E | BOP/SB-2 | BOP/TB-2 | 271'-0" | HVAC SUPPLY DUCT TO SERVICE BUILDING ADDITION ZONE 6 | EAST WALL |
| TBW - 3F | BOP/SB-2 | BOP/TB-2 | 271'-0" | HVAC SUPPLY DUCT TO SERVICE BUILDING ADDITION ZONE 7 | EAST WALL |
| TSCD - 19 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | TSC KITCHEN, LAVORATORIES EXHAUST AIR DUCT TO ROOF | NORTH WALL |
| TSCD - 22 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | SUPPLY AIR TO TSC DIESEL GEN. RM FROM INVERTER RM | WEST WALL |
| TSCD - 24 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | TSC DIESEL GENERATOR RM TO INVERTER RM TRANSFER OPNG | WEST WALL |
| TSCI - 1 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | SUPPLY AIR WALL OPNG TO TSC CORRIDOR | NORTH WALL |
| TSCI - 2 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | WALL TRANSFER OPENING BETWEEN CORRIDOR AND INVERTER RM | NORTH WALL |
| TSCI - 12 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | EXHAUST AIR FROM TSC INVERTER RM TO TSC BATT. RM. | WEST WALL |
| TSCI - 13 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | RA FROM TSC BATTERY RM TO TSC INVERTER RM | WEST WALL |
| TSCMR - 60 | BOP/TSC-1N | BOP/TSC-1M | 271'-0" | TSC MAIN AHU DISCHARGE SUPPLY AIR DUCT | NORTH WALL |
| TSCMR - 90 | BOP/TSC-1N | BOP/TSC-1M | 271'-0" | COMMON PLENUM RETURN TO TSC MAIN AHU SYSTEM | NORTH WALL |

| **DAMPER IDENTIFICATION(1)** | **FROM: Fire Area /Fire Zone(2)** | **TO: Fire Area /Fire Zone(2)** | **ELEV.** | **HVAC SYSTEM** | **DAMPER LOCATION(3)** |
|---|---|---|---|---|---|
| TSCMR - 165 | BOP/TSC-1M | BOP/TSC-1M | 271'-0" | ADMINISTRATION OFFICE RA TO TSC HVAC UNIT | WEST WALL |
| TSCMR - 166 | BOP/TSC-1M | BOP/TSC-1M | 271'-0" | SUPPLY AIR TO TSC ADMIN. OFFICE | WEST WALL |
| TSCSC - 360 | BOP/TSC-1N | BOP/TSC-1S | 271'-0" | EXHAUST AIR FROM TSC KITCHEN & LAVORATORIES TO ROOF | SOUTH WALL |
| DGVB-85 | EDG1B/EDG1B | EDG1A/EDG1A | 245'-0" | DAMPER NORMALLY CLOSED / PROVIDED FOR ACCESS PURPOSES ONLY | NORTH WALL |

Notes:

1. Damper location relative to the "FROM" location. Refer to drawing 33013-1862 and the Fire Response Plans for more detailed information regarding locations of fire dampers.
2. PCR 96-125 also eliminated duct penetration RR-113-P which was previously evaluated to be acceptable without a fire damper. Duct was removed and wall barrier restored with block materials.

# Table 8-2
# FIRE DOORS

| DOOR NUMBER(1) | FROM: Fire Area /Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | LOCATION:(3) |
|---|---|---|---|---|
| F1 | CHG | ABBM/ABB | 235'-8" | SPRAY ADDITIVE TANK ROOM |
| F2 | CHG | ABBM/ABB | 235'-8" | CHARGING PUMP ROOM. SOUTH ENTRANCE |
| F3 | ABI/IBN-1 | CT | 253'-6" | INTERMEDIATE BUILDING (CLEANSIDE) TO CABLE TUNNEL ENTRANCE |
| F3A1 | ABBM/ABM | CT | 253'-6" | AUXILIARY BUILDING INTERMEDIATE FLOOR TO CABLE TUNNEL |
| F4 | CC/CR | CC/CR | 289'-6" | CONTROL ROOM KITCHEN |
| F5 & F5-1 | BOP/SB-2 | BOP/TB-2 | 271'-0" | SERVICE BUILDING TO TURBINE BUILDING INTERMEDIATE FLOOR |
| F6 & F6-1 | BOP/SB-2 | BOP/TB-2 | 271'-0" | I&C SHOP ENTRANCE TO TURBINE BUILDING INTERMEDIATE FLOOR |
| F7 | BOP/TB-2 | BOP/TSC-1S | 272'-0" | TURBINE BUILDING S.E. CORNER ENTRANCE TO TSC |
| F8 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | TSC HALLWAY TO BATTERY ROOM |
| F9 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | TSC HALLWAY TO INVERTER ROOM |
| F10 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | TSC HALLWAY TO DIESEL GENERATOR ROOM |
| F11 | BOP/TSC-1S | BOP/TSC-1S | 271'-0" | TSC HALLWAY TO OUTDOORS (EAST SIDE) |
| F12 | BOP/TSC-1N | BOP/TSC-1S | 271'-0" | TSC ENTRANCE FROM TSC SOUTH HALLWAY |
| F13 | BOP/TSC-1M | BOP/TSC-1M | 271'-0" | TSC NORTH INTERIOR DOOR IN TSC |
| F13A & 13A-1 | BOP/TSC-1M | BOP/TSC-1M | 271'-0" | TSC MECHANICAL EQUIPMENT ROOM |
| F14 | BOP/TB-2 | BOP/TSC-1M | 271-0" | TURBINE BUILDING N.E. CORNER ENTRANCE TO TSC |

| **DOOR NUMBER(1)** | **FROM: Fire Area /Fire Zone(2)** | **TO: Fire Area /Fire Zone(2)** | **ELEV.** | **LOCATION:(3)** |
|---|---|---|---|---|
| F15 | BOP/SB-2 | BOP/TB-2 | 271'-0" | SERVICE BUILDING ADD. TO N.W. TURBINE BUILDING INTERMEDIATE FLOOR |
| F16 | BOP/SB-2 | BOP/SB-l | 27l'-0" | SERVICE BUILDING ADD. TO SERVICE BUILDING STAIR WELL MAIN FLOOR |
| F17 | BOP/SB-l | BOP/SB-l | 253'-6" | SERVICE BUILDING ADD. TO SERVICE BUILDING STAIR WELL BASEMENT |
| F18 | BOP/SB-l | BOP/SB-l | 253'-6" | SERVICE BUILDING ADD. TO SERVICE BUILDING CORRI-DOR NORTH END |
| F19 | BOP/SB-l | BOP/TB-l | 253'-6" | SERVICE BUILDING BSMT TO TURBINE BUILDING AT ELE-VATOR |
| F20 | BOP/SB-l | BOP/TB-l | 253'-6" | SERVICE BUILDING TO TUR-BINE BUILDING ROLL UP DOOR |
| F21 | BOP/TB-l | BOP/TB-l | 253'-6" | BASEMENT WEST WALL OF SEAL OIL UNIT OH DOOR |
| F21A | BOP/TB-l | BOP/TB-l | 253'-6" | BASEMENT WEST WALL OF SEAL OIL UNIT |
| F21B | BOP/TB-l | BOP/TB-l | 253'-6" | BASEMENT CEILING OF SEAL OIL UNIT |
| F21C | BOP/TB-l | BOP/TB-l | 253'-6" | BASEMENT CEILING OF SEAL OIL UNIT |
| F22 | BOP/TB-l | BOP/TB-l | 253'-6" | BASEMENT SEAL OIL UNIT SOUTH WALL |
| F23 | BOP/TB-l | BOP/TB-l | 253'-6" | BASEMENT SEAL OIL UNIT EAST WALL |
| F24 & F24-l | BOP/TB-l | CC/AHR | 253'-6" | TURBINE BUILDING TO CON-TROL BUILDING VENTILA-TION ROOM |
| F25 | BOP/TB-l | BR1A | 253'-6" | TURBINE BUILDING TO BAT-TERY ROOM "A" |
| F26 | BOP/TB-l | BR1B | 253'-6" | TURBINE BUILDING TO BAT-TERY ROOM "B" |

| DOOR NUMBER(1) | FROM: Fire Area /Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | LOCATION:(3) |
|---|---|---|---|---|
| F27 | BOP/TB-1 | BOP/AVT | 253'-6" | TURBINE BUILDING TO SE BASEMENT CORNER TO CON-DENSATE DEMINERALIZER BUILDING |
| F28 | BOP/TB-1 | BOP/AVT | 253'-6" | TURBINE BUILDING TO NE BASEMENT CORNER TO CON-DENSATE DEMINERALIZER BUILDING |
| F29 & F29-1 | BOP/TB-1 | EDG1B | 253'-6" | TURBINE BUILDING TO DG "B" |
| F30 & F30-1 | BOP/TB-1 | EDG1A | 253'-6" | TURBINE BUILDING TO DG "A" |
| F31 & F31-1 | BOP/TB-1 | BOP/TO | 253'-6" | TURBINE BUILDING TO OIL STORAGE BUILDING |
| F32 | BOP/TSC-1N | BOP/TSC-1N | 271'-0" | TSC TO SAS/PPCS COMPUTER ROOM (TSC) NORTH DOOR |
| F33 | BOP/TSC-1N | BOP/TSC-1N | 271'-0" | TSC TO SAS/PPCS COMPUTER ROOM (TSC) SOUTH DOOR |
| F36 | BOP/TB-1 | ABI/IBN-1 | 253'-6" | TURBINE BUILDING TO CLEAN SIDE OF INTERMEDIATE BUILDING AT SWGR ROLLING FIRE DOOR |
| F500 | BOP/TB-1 | STAIRS | 253'-6" | TURBINE BUILDING BASE-MENT STAIRTOWER ENTRANCE |
| F501 | BOP/TB-2 | STAIRS | 271'-0" | TURBINE BUILDING INTERME-DIATE FLOOR STAIRTOWER ENTRANCE |
| F502 | CC/RR | CC/RR | 271'-0" | RELAY ROOM ENTRANCE TO STAIRTOWER OF CONTROL BUILDING |
| F502A | CC/RR | CC/RRA | 271'-0" | RELAY ROOM TO RELAY ROOM ANNEX |
| F503 | ABI/IBS-2 | ABI/ABO | 271'-0" | INTERMEDIATE BUILDING CONTROLLED SIDE TO AUXIL-IARY BUILDING |
| F504 & F504-1 | CC/RR | BOP/TB-2 | 271'-0" | TURBINE BUILDING TO RELAY ROOM INTERIOR SET OF DOORS |

| DOOR NUMBER(1) | FROM: Fire Area /Fire Zone(2) | TO: Fire Area /Fire Zone(2) | ELEV. | LOCATION:(3) |
|---|---|---|---|---|
| F505 | BOP/TB-3 | STAIRS | 289'-6" | TB OPERATING FLOOR ACCESS FROM STAIRTOWER |
| F506 | BOP/TB-3 | STAIRS | 315'-4" | TURBINE BUILDING BRIDGE CRANE ACCESS FROM STAIR-TOWER |
| F507 & F507-1 | CC/RR | CC/RR | 271'-0" | RELAY ROOM TO MULTI-PLEXER ROOM (Removed under PCR 96-125) |
| F508 | CC/RR | CC/RR | 271'-0" | RELAY ROOM MULTIPLEXER ROOM SOUTH DOOR TO STAIR-TOWER |
| F509 | ABI/IBS-1 | BOP/SB-1HS | 253'-6" | INTERMEDIATE BUILDING CONTROLLED SIDE ACCESS TO HOT SHOP |
| F510 | ABI/IBS-2 | BOP/SB-2 | 271'-0" | INTERMEDIATE BUILDING CONTROLLED SIDE ACCESS TO PASS DOOR |
| F600 | BOP/TB-3 | BOP/TB-3 | 315'-4" | TURBINE BUILDING ELEVA-TOR EQUIPMENT ROOM ENTRANCE |
| F604 | BOP/SB-2 | BOP/SB-2 | 271'-0" | WEST STAIRTOWER AT LOCKER ROOM |
| F605 | BOP/SB-1 | BOP/SB-1 | 253'-6" | BASEMENT EXIT FROM STAIR-TOWER TO SHOPS |
| F606 | N/A | N/A | 271’-0” | NUCLEAR ASSESSMENT BUILDING TOP FLOOR ENTRANCE DOOR TO WEST STAIRWELL |
| F607 | N/A | N/A | 271’-0” | NUCLEAR ASSESSMENT BUILDING GROUND FLOOR ENTRANCE DOOR |
| F608 | YARD | YARD | 271'-0" | DOOR BETWEEN MAIN TRANS-FORMERS SOUTH CONTROL BUILDING |
| F609 | N/A | N/A | 271’-0” | NUCLEAR ASSESSMENT BUILDING TOP FLOOR WEST DOOR TO OFFICES |
| F610 & F610-1 | WS | WS | 271'-0" | CORRIDOR (SOUTH END) TO CONTAMINATED STORAGE. Removed from service under TSR 2001-0139. |

| **DOOR NUMBER[1]** | **FROM: Fire Area /Fire Zone[2]** | **TO: Fire Area /Fire Zone[2]** | **ELEV.** | **LOCATION:[3]** |
|---|---|---|---|---|
| S29F & S29F-1 | ABI/ABO | WS | 271'-0" | ENTRANCE TO CORRIDOR OF CONTAMINATED STORAGE BUILDING FROM AUXILIARY BUILDING |
| S37F & S37F-1 | ABI/IBN-1 | BOP/TB-1 | 253'-6" | TURBINE BUILDING TO CLEAN SIDE OF INTERMEDIATE BUILDING RAMPED ENTRANCE |
| S44F | BOP/TB-2 | ABI/IBN-2 | 271'-0" | TURBINE BUILDING TO INTER-MEDIATE CLEAN SIDE |
| S46F | ABI/IBS-2 | BOP/SB-2 | 271'-0" | SERVICE BUILDING DRESSING AREA TO INTERMEDIATE CON-TROLLED SIDE |
| S49F | BR1A | BR1B | 253'-6" | DOOR BETWEEN BATTERY ROOMS "A" & "B" |
| S51F & S5lF-1 | CC/CR | BOP/TB-3 | 289'-6" | ENTRANCE TO CONTROL ROOM FROM TURBINE BUILD-ING |
| S65F | ABI/IBS-2 | BOP/SB-2 | 271'-0" | FROM SIGN-IN DESK IN CON-TROLLED INTERMEDIATE TO SERVICE BUILDING MONITOR AREA |
| S100BF | CPB | CSB | 269'-2" | Canister Preparation Building to Contaminated Storage Building |
| F101A | CPB | CPB Electri-cal Room | 269'-2" | CPB Proper to Electrical Room |
| F101C | CPB | CPB Mechan-ical Room | 269'-2" | CPB Proper to Mechanical Room |
| F700 | GAB | GAB Vault | 271’-0” | Interior Vault Fire Door |

Notes:

1. Refer to Fire Door Location drawings 33013-2617 (sheets 1 through 3) and the Fire Response Plans for more detailed information regarding locations of fire doors.

# Table 8-3
## FIRE SUPPRESSION SYSTEMS

| SYSTEM NO. | DESCRIPTION | FIRE AREA/ ZONE | SUPPRESSION TYPE | DETECTION TYPE |
|---|---|---|---|---|
| S01 | Auxiliary Building Basement | ABBM/ABB | Auto Pre-Action | Smoke |
| S02 | Auxiliary Building Charcoal Filter 1G | ABBM/ABM | Auto Deluge | Heat |
| S03 | Auxiliary Building W. Mezzanine | ABBM/ABM | Auto Pre-Action | Smoke |
| S04 | Auxiliary Building E. Mezzanine | ABBM/ABM | Auto Pre-Action | Smoke |
| S05 | Cable Tunnel | CT | Auto Deluge | Smoke |
| S06 | Control Building - Air Handling Room | CC/AHR | Auto Deluge | Smoke |
| S08 | Control Building - Relay and Computer Room - S07 + S08 Combined under PCR-96-125 | CC/RR | Auto-Halon | Smoke |
| S09 | Control Building - Relay Room (South) | CC/RR | Manual Deluge | None |
| S10 | Control Building - Relay Room (West) | CC/RR | Manual Deluge | None |
| S11 | Control Building - Relay Room (Northeast) | CC/RR | Manual Deluge | None |
| S12 | Diesel Room 1A | EDG1A | Auto Pre-Action | Heat |
| S13 | Diesel Room 1B | EDG1B | Auto Pre-Action | Heat |
| S14 | Intermediate Building - AFWP | ABI/IBN-1 | Manual Deluge | Heat |
| S15 | Intermediate Building East Basement | ABI/IBN-1 | Auto Pre-Action | Smoke |
| S16 | Oil Storage Room | BOP/TO | Auto Deluge | Proto-Matic |
| S17 | Screen House Basement | SH/SH-1 | Auto Deluge | Smoke |
| S18 | Screen House Service Water Pumps | SH/SH-2 | Auto Sprinkler | None |
| S19 | Service Building | SB | Auto Sprinkler | None |
| S20 | Transformer 1 | YARD | Auto Deluge | Heat |
| S21 | Transformer 11 | YARD | Auto Deluge | Heat |

| SYSTEM NO. | DESCRIPTION | FIRE AREA/ ZONE | SUPPRESSION TYPE | DETECTION TYPE |
|---|---|---|---|---|
| S22 | Transformer 12A | YARD | Auto Deluge | Heat |
| S23 | Transformer 12B | YARD | Auto Deluge | Heat |
| S24 | Turbine Building Condenser Pit | BOP/TB-1 | Manual Deluge | Heat |
| S25 | Turbine Building H2 Seal Oil | BOP/TB-1 | Auto Deluge | Heat |
| S26 | Turbine Building Turbine Island | BOP/TB-1,TB-2 | Auto Sprinkler | None |
| S27 | Turbine Building Turbine Oil Reservoir | BOP/TB-1,TB-2 | Auto Deluge | Heat |
| S29 | Turbine Building Control Room Wall | BOP/TB-3 & CC/CR | Auto Spray and manual | Heat |
| S30 | Technical Support Center - Operational Support Center and TSC Diesel Generator Room | BOP/TSC-1S | Auto Sprinkler | None |
| S31 | Technical Support Center - Charcoal Filter | BOP/TSC-1M | Auto Deluge | Heat |
| S33 | Technical Support Center - HVAC Duct | BOP/TSC-1M,1N | 2 Hose Stations | Smoke |
| S34D1 | TSC Computer Room - HVAC Disconnect | BOP/TSC-1M | N/A | Smoke |
| S34D2 | TSC Computer Room - Computer Disconnect | BOP/TSC-1M | N/A | Smoke |
| S35 | Auxiliary Building - East Stairs | ABBM/ABM | Auto Sprinkler | None |
| S36 | Auxiliary Building - West Stairs and Crane Hatch | ABBM/ABM | Auto Sprinkler | None |
| S37 | TSC SAS/PPCS Computer, above and below raised floor. | BOP/TSC-1N | Auto-Halon | Smoke |
| S38 | Turbine Building Intermediate Floor East End Offices | BOP/TB-2 | Auto Sprinkler | None |
| S50 | Contaminated Storage Building | WS | Auto Sprinkler | None |
| S39 | Service Building Cafeteria Wet Chemical System | BOP/SB-1 | Auto Wet Chemical | Heat |

| SYSTEM NO. | DESCRIPTION | FIRE AREA/ ZONE | SUPPRESSION TYPE | DETECTION TYPE |
|---|---|---|---|---|
| S40 | Ginna Admin Building | BOP/GAB | Auto Sprinkler | None |
| S40C | Document Storage Vault Clean Agent Suppression System | BOP/GAB | NOVEC 1230 System | Heat Detector |
| S41A | CREATS Train "A" Deluge Pipe Suppression System | CC/CR | Manual Hose Connection to pipe | High Temp Sensors |
| S41B | CREATS Train "B" Deluge Pipe Suppression System | CC/RR | Manual Hose Connection to pipe | High Temp Sensors |
| S45 | GE Betz Water Treatment Trailers | BOP/TB-l | Auto Sprinkler | None |
| S51 | Canister Preparation Building | ABI/CPB | Auto Sprinkler (Dry Pipe) | None |
| S52 | SAFW Building | SAF/SAF | Pre-Action | Smoke/Heat |
| S53 | NFPA D/G Enclosure | PA/SE | FM-200 | Heat |

# Table 8-4
# FIRE DETECTION SYSTEMS

| SYSTEM NO. | DESCRIPTION | FIRE AREA/ZONE | DETECTION TYPE |
|---|---|---|---|
| Z01 | Auxiliary Building East Basement | ABBM/ABB, CHG | Smoke |
| Z02 | Auxiliary Building W. Basement | ABBM/ABB | Smoke |
| Z03 | Auxiliary Building Penetration | ABBM/ABM | Smoke |
| Z04 | Auxiliary Building Bus l4 | ABI/ABO | Smoke |
| Z05 | Cable Tunnel | CT | Heat |
| Z06 | Containment Auxiliary Filter 1A | RC/RC-3 | Heat |
| Z07 | Containment Auxiliary Filter 1B | RC/RC-3 | Heat |
| Z08 | Containment Basement | RC/RC-l | Thermistor |
| Z09 | Containment Recirculation Filter 1A1 | RC/RC-3 | Heat |
| Z10 | Containment Recirculation Filter 1A2 | RC/RC-3 | Heat |
| Z11 | Containment Recirculation Filter 1B1 | RC/RC-3 | Heat |
| Z12 | Containment Recirculation Filter 1B2 | RC/RC-3 | Heat |
| Z13 | Containment RC Pump 1A | RC/RC-2,RC-3 | Thermistor |
| Z14 | Containment RC Pump 1B | RC/RC-2,RC-3 | Thermistor |
| Z15 | Containment Intermediate Floor | RC/RC-l,RC-2 | Thermistor |
| Z16 | Containment Operating Floor | RC/RC-3 | Thermistor &Smoke |
| Z18 | Control Building - Relay Room | CC/RR | Heat |
| Z19 | Control Building - Control Room | CC/CR | Smoke & Heat |

| SYSTEM NO. | DESCRIPTION | FIRE AREA/ZONE | DETECTION TYPE |
|---|---|---|---|
| Z20 | Diesel Vault A | EDG1A | Smoke |
| Z21 | Diesel Vault B | EDG1B | Smoke |
| Z22 | Intermediate Building AFWP Area | ABI/IBN-1 | Smoke |
| Z23 | Intermediate Building Purge Filter A | ABI/IBN-4 | Smoke |
| Z24 | Intermediate Building Purge Filter B | ABI/IBN-4 | Smoke |
| Z25 | SAF Building | SAF | Smoke |
| Z26 | Screen House Bus I7, I8 | SH/SH-2 | Smoke |
| Z27 | Technical Support Center - Cable Tunnel | BOP/TSC-1S | Smoke |
| Z28 | Technical Support Center - Office | BOP/TSC-1N | Smoke |
| Z29 | Technical Support Center - N. Equipment Room | BOP/TSC-1M | Smoke |
| Z30 | Technical Support Center - S. Equipment Room | BOP/TSC-1S | Smoke/Heat |
| Z31 | Technical Support Center - S. Vestibule | BOP/TSC-1N | Smoke/Heat |
| Z32 | Turbine Building N. Base-ment | BOP/TB-1 | Smoke |
| Z33 | Turbine Building S. Base-ment | BOP/TB-1 | Smoke |
| Z34 | Turbine Building E. Mezza-nine | BOP/TB-2 | Smoke |
| Z35 | Spent Fuel Pit | ABI/ABO | Photo Electric |
| Z36 | Intermediate Building - Sub-Basement | ABI/IB-0 | Photo Electric |
| Z37D1 | Intermediate Building - Steam Header | ABI/IBN-2 | Photo Electric |
| Z37D2 | Intermediate Building - Elev. above Steam Header | ABI/IBN-3 | Photo Electric |
| Z37D3 | Intermediate Building - Top Floor | ABI/IBN-4 | Photo Electric |
| Z38D1 | Intermediate Building - Basement Hotside | ABI/IBS-1 | Photo Electric |

| SYSTEM NO. | DESCRIPTION | FIRE AREA/ZONE | DETECTION TYPE |
|---|---|---|---|
| Z38D2 | Intermediate Building - Main Floor Hotside | ABI/IBS-2 | Photo Electric |
| Z38D3 | Intermediate Building - Top Floor Hotside | ABI/IBS-3 | Photo Electric |
| Z39 | Technical Support Center - Raised Floor | BOP/TSC-1N | Smoke |
| Z40 | Turbine Building Basement Floor in area of Condensate Booster Pumps> | BOP/TB-1 | Smoke |
| Z41 | Turbine Building Intermediate Floor in area of Switchgear | BOP/TB-2 | Smoke |
| Z42 | Battery Room A | BR1A/BR1A | Smoke |
| Z43 | Battery Room B | BR1B/BR1B | Smoke |
| Z44 | Relay Room Annex | CC/RR | Smoke |
| Z45 | Ginna Admin Building | BOP/GAB | Smoke/Heat |

# Table 8-5
# CABLE WRAP

| RACEWAY NO:/COMP | BUILDING/ELEVATION: | FIRE AREA/ZONE: |
|---|---|---|
| E20 | Battery Room 1B | BR1B |
| E22 | Battery Room 1B | BR1B |
| E53 | Battery Room 1B and Auxiliary Building Intermediate Level | BR1B<br>ABBM/ABM |
| C687 | Battery Room 1B and Auxiliary Building Intermediate Level | BR1B<br>ABBM/ABM |
| Tray 111 | Auxiliary Building Intermediate Level | ABBM/ABM |
| L318 | Battery Room 1B | BR1B |
| L398 | Auxiliary Building Basement and Intermediate Level | ABBM/ABB<br>ABBM/ABM |
| L400 | Auxiliary Building Intermediate Level | ABBM/ABM |
| R1467 | Reactor Containment | RC/RC-2 |
| R1468<br>R1472<br>R1475<br>N31 Preamp | Intermediate Building | ABI/IBN-1 |
| R975<br>PT478 | Intermediate Building | ABI/IBN-1 |
| R877A<br>PT420A | Reactor Containment | RC/RC-2 |
| R1133<br>LT433 | Reactor Containment | RC/RC-2 |

# Table 8-6
# HOSE REELS

| Hose Reel Number | Fire Area/ Fire Zone | Building/Elevation | Location[(1)] |
|---|---|---|---|
| 1 | BOP/TB-1 | Turbine Building, 253'-6" | Elevator |
| 2 | BOP/TB-1 | Turbine Building, 253'-6" | Battery Room |
| 3 | BOP/TB-1 | Turbine Building, 253'-6" | Oil Storage Room |
| 4 | BOP/TB-1 | Turbine Building, 253'-6" | S/G FW Pumps |
| 5 | BOP/TB-2 | Turbine Building, 271'-0" | Elevator |
| 6 | BOP/TB-2 | Turbine Building, 271'-0" | 4160 Bus |
| 7 | BOP/TB-2 | Turbine Building, 271'-0" | Air-Ejector |
| 8 | BOP/TB-2 | Turbine Building, 271'-0" | SA Heater |
| 9 | BOP/TB-3 | Turbine Building, 289'-6" | Elevator |
| 10 | BOP/TB-3 | Turbine Building, 289'-6" | Control Room |
| 11 | BOP/TB-3 | Turbine Building, 289'-6" | North Wall |
| 12 | ABI/IBN-4 | Intermediate Building, 315'-4" | West |
| 13 | ABI/IBN-4 | Intermediate Building, 315'-4" | East |
| 14 | ABI/IBN-3 | Intermediate Building, 298'-4" | East |
| 15 | ABI/IBN-3 | Intermediate Building, 298'-4" | West |
| 16 | ABI/IBN-2 | Intermediate Building, 278'-4" | West |
| 17 | ABI/IBN-2 | Intermediate Building, 278'-4" | East |
| 18 | ABI/IBN-1 | Intermediate Building, 253'-6" | East |
| 19 | ABI/IBN-1 | Intermediate Building, 253'-6" | West |
| 20 | ABI/IBS-1 | Intermediate Building, 253'-6" | South |
| 21 | ABI/IBS-2 | Intermediate Building, 271'-0" | Nuclear Sample Room |
| 22 | ABI/ABO | Auxiliary Building, 271'-0" | West |
| 23 | ABI/ABO | Auxiliary Building, 271'-0" | Center |
| 24 | ABI/ABO | Auxiliary Building, 271'-0" | East |
| 25 | ABI/ABM | Auxiliary Building, 253'-0" | East |
| 26 | ABI/ABM | Auxiliary Building, 253'-0" | Center |
| 27 | ABI/ABM | Auxiliary Building, 253'-0" | West |
| 28 | ABI/ ABB | Auxiliary Building, 235'-8" | West |

| Hose Reel Number | Fire Area/ Fire Zone | Building/Elevation | Location(1) |
|---|---|---|---|
| 29 | ABI/ ABB | Auxiliary Building, 235'-8" | Center |
| 30 | ABI/ ABB | Auxiliary Building, 235'-8" | East |
| 31 | SH/SH-2 | Screen House, 253'-6" | Fire Pumps |
| 32 | BOP/AVT | AVT Building, 247'0" | Northwest Center |
| 33 | RC/RC-3 | Containment Building, 274'-6" | West |
| 34 | RC/RC-3 | Containment Building, 278'-4" | East |
| 35 | RC/RC-2 | Containment Building, 253'-3" | West |
| 36 | RC/RC-2 | Containment Building, 253'-3" | East |
| 37 | RC/RC-1 | Containment Building, 235'-8" | West |
| 38 | RC/RC-1 | Containment Building, 235'-8" | East |
| 39 | BOP/SB-1 | Service Building, 253'-6" | North Hall |
| 40 | BOP/SB-2 | Service Building, 271'-0" | North Hall |
| 41 | BOP/TSC-1M | TSC, 271'-0" | East |
| 42 | BOP/TSC-1N | TSC, 272'-0" | West |
| 43 | ABI/CPB | Canister Preparation Building, 269'-2" | North |

Note:
1. Location indicates area served by the hose reel, not necessarily the location of the hose reel.

# 9.0 NFPA 805 Fire Rooms

For the purpose of tracking cable routing, drawing series 33013-2928 were developed during the transition to NFPA 805. These drawings show all the boundaries of each fire zone along with the sub-division of rooms within the fire zones. These drawings along with the fire response drawings can be used to identify the fire area and zone boundaries applicable at Ginna.

# APPENDIX A

# HISTORICAL SUMMARY OF APPENDIX A COMMITMENTS

# INTRODUCTION

The Appendix A Commitment Summary table was generated as part of Ginna's ongoing effort to consolidate and enhance the Ginna Station Fire Protection Program. This table identifies Ginna commitments which were made in response to NRC guidance provided in Appendix A to Branch Technical Position (BTP) APSCB 9.5-1, dated August 23, 1976. Documents reviewed as part of this effort are referenced and identified as appropriate.

The enclosed Appendix A Commitment Summary table was developed consistent with the sections and subsections of Appendix A to BTP 9.5-1. The enclosed table contains the following columns:

- Appendix A Guidelines

  This column provides the Appendix A guidelines for plants under construction and operating plants.

- Initial Ginna Commitment

  This column identifies the commitments as defined in Ginna's original response to the identified Appendix A guidelines. These commitments are summarized based on the information contained in the Ginna Fire Protection Evaluation (FPE) and the enclosed Fire Hazards Analysis (Section 4.0 to the FPE) which was submitted to the NRC via 2/24/77 letter (RG010540).

Note: Appendix A is “HISTORICAL”.

- Ginna Commitment Additions and Revisions

  This column identifies revisions to the original commitments and additional commitments made subsequent to the initial Ginna Appendix A response and associated NRC approval of the Ginna Station Fire Protection Program. The following RG&E letters contained substantial commitment revisions:

  RG009142, RG&E/NRC, 5/15/78, Subject: RG&E response to the FRACQA letter.

  RG009126, RG&E/NRC, 6/9/78, Subject: Response to NRC request for additional information for the Fire Hazards Analysis.

  RG010682, RG&E/NRC, 9/1/78, Subject: Responses to staff positions from 7/20/78 trip report.

  RG009792, RG&E/NRC, 9/22/78, Subject: Responds to remainder of the staff positions from 7/20/78 trip report.

  RG010689, RG&E/NRC, 10/18/78, Subject: Requests NRC approval for five fire doors to be installed in common wall between control building and the turbine building and for the two doors between the diesel generator rooms and the turbine building.

  RG001562, RG&E/NRC, 10/31/78, Subject: Response to most issues in 10/6/78 letter from NRC; Revises RG&E response to positions 9, 28, 35, 76, 77 and 80.

  RG001798, RG&E/NRC, 4/30/79, Subject: Provides additional information for SER Items 3.1.24, 3.1.25, 3.1.43, and 3.2.4.

  RG001838, RG&E/NRC, 5/25/79, Subject: Commits to a fire brigade size of five (SER item 3.2.9); Additional information on battery room ventilation (SER item 3.1.11).

  RG002065, RG&E/NRC, 9/28/79, Subject: September information submittals for SER (SER Items 3.1.2, 3.1.8, 3.1.21, 3.1.46, 3.1.48, and 3.2.6).

  RG002248, RG&E/NRC, 12/18/79, Subject: Response to SER items 3.1.39, 3.1.5, 3.1.24, 3.1.34, and 3.2.8.

  RG002591, RG&E/NRC, 5/23/80, Subject: Response to SER items 3.1.8, 3.1.11, 3.1.21, 3.1.48 and 3.1.49.

  RG002603, RG&E/NRC, 5/29/80, Subject: Updates on SER items 3.1.5, 3.1.24, 3.1.34, and 3.2.8.

  RG002621, RG&E/NRC, 6/4/80, Subject: Response to NRC request for information dated 4/25/80.

  RG002659, RG&E/NRC, 6/30/80, Subject: Response to SER item 3.2.8 - exposed structural steel protection.

  RG003327, RG&E/NRC, 6/3/81, Subject: Commitment revision - Fire Door supervision (SER Item 3.1.30).

  RG003690, RG&E/NRC, 11/19/81, Subject: Commitment revision - Automatic Suppression.

- NRC SERs

  This column identifies the NRC Safety Evaluation Reports which document approval of the Ginna Station Fire Protection Program and associated Appendix A commitments. The following Safety Evaluation Reports were reviewed:

  RG001680, NRC/RG&E, 2/14/79, Subject: License Amendment No. 24; and Enclosed 2/14/79 Fire Protection Program SER.

  RG002307, NRC/RG&E, 1/23/80, Subject: License Amendment No. 30 - Changes minimum fire brigade shift size from three to five.

  RG002538, NRC/RG&E, 4/25/80, Subject: NRC review of SER submittals and a request for additional information.

  RG002940, NRC/RG&E, 12/17/80, Subject: Supplement 1 to 2/14/79 SER.

  RG003007, NRC/RG&E, 2/6/81, Subject: Supplement 2 to 2/14/79 SER.

  RG003357, NRC/RG&E, 6/22/81, Subject: Supplement 3 to 2/14/79 SER: revises the requirements of item 3.1.30 fire door supervision.

  RG004229, NRC/RG&E, 5/26/82, Subject: SER on Suppression and Detection commitment changes.

- Current Status/Comments

  The Appendix A Commitment Summary Table is historical.

  The comparison of the Ginna Fire Protection Program to the requirements of NFPA 805 was performed and documented in 51-9064339-003, NFPA 805 Fundamental Fire Protection Program and Design Elements Transition Review. This reference is “historic”. It was classified “historic” to capture the B-1 Table as presented to the NRC to support the approved NFPA 805 License Amendment Request (WPLNRC-1003035). The B-1 Table now resides in Appendix B. Changes to the B-1 Table are made using IP-FPP-1.

# HISTORICAL
# Table A-1
# Appendix A Commitment Summary Table

| Appendix A Guidelines | RG&E Commitment in FPE (3/77) | RG&E Commitment Additions/Revisions Prior to NRC Program Approval | NRC SERs Documenting Program Approval | Current Status /Comments |
|---|---|---|---|---|
| A. Overall Requirements of Nuclear Plant Fire Protection Program | | | | |
| A.1 Personnel | | | | |
| Responsibility for the overall fire protection program should be assigned to a designated person in the upper level of management. This person should retain ultimate responsibility even though formulation and assurance of program implementation is delegated. Such delegation of authority should be to staff personnel prepared by training and experience in fire protection and nuclear plant safety to provide a balanced approach in directing the fire protection programs for nuclear power plants. The qualification requirements for the fire protection engineer or consultant who will assist in the design and selection of equipment, inspect and test the completed physical aspects of the system, develop the fire protection program, and assist in the fire-fighting training for the operating plant should be stated. Subsequently, the FSAR should discuss the training and the updating provisions such as fire drills provided for maintaining the competence of the station fire-fighting and operating crew, including personnel responsible for maintaining and inspecting the fire protection equipment. | The Vice President, Electric and Steam Production, is responsible for the operation of Ginna and, therefore, has overall responsibility for its fire protection program. The formulation and performance of program implementation is delegated through the Division Superintendent of Electric and Steam Production to the Station Superintendent. In addition, support for new evaluations and designs and assurance of implementation are provided by the RG&E Engineering Department, Claims and Insurance Department, and the RG&E Safety Division. Education and experience in fire protection and prevention is required for all company fire protection staff positions. Consultation with others in the utility industry to stay abreast of new products or methods is a normal duty. Personnel from these groups and personnel from the station staff comprise a fire protection staff (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-2). | In response to NRC request, RG&E reviewed the fire protection program for conformance to guidelines identified in NRC document entitled "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance (FRACQA). " The following specific commitments were identified:<br>A1-1: The Vice President of Electric and Steam Production has the management responsibility for the formulation implementation and assessment of the effectiveness of the Ginna Station fire protection program (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 1.0a).<br>A1-2: The Corporate Fire Marshall and Fire Protection Engineer share the responsibility of formulating, implementing, and periodically assessing the effectiveness of the fire protection program (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 1.0b). | The fire protection organization encompasses positions extending from the Vice President of Electric and Steam Production to the Station Shift Foreman. These management and staff positions are responsible for formulation, implementation, and assessment of the fire protection program. The licensee has described the organizational responsibilities for inspection, training, review of design changes, review of proposed work activities, the station documents that define these and other responsibilities as related to plant fire protection, and the qualification requirements that have been established for the responsible positions. (RG001680, FP SER dated 2/14/79, Section 6.1) | The current fire protection program organization and responsibilities are outlined in the Fire Protection Program Report (FPPR). See FPPR Part II - Fire Protection Plan and procedure A-202. |
| The fire protection staff should be responsible for:<br>a. Coordination of building layout and systems design with fire area requirements, including consideration of potential hazards associated with postulated design basis fires,<br>b. Design and maintenance of fire detection, suppression, and extinguishing systems,<br>c. Fire prevention activities,<br>d. Training and manual fire-fighting activities of plant personnel and the fire brigade. | The Engineering Department's Fire Protection Engineer with assistance from other plant staff reviews plant lay out and fire protection system design.<br>The Ginna Station Maintenance Engineer is responsible for FP system maintenance and fire prevention activities.<br>The Operations Engineer is responsible for fire fighting. The Station Training Coordinator is responsible for training the fire fighting organization. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-3 through 5) | A1-3: The Superintendent is responsible for the overall administration of the plant operations and emergency plans which include the fire protection and prevention program (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 1.0c). | | |

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| | | A1-4: The Fire Control Supervisor is responsible to see that inspections are performed to assure good housekeeping, that all fire protection systems/equipment are in place and in acceptable condition, and that corrective actions are taken to correct conditions adverse to fire protection and to preclude their recurrence (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 1.0d). | | Fire Marshall and engineering roles defined in procedure A-202. |
| | | A1-5: The design and selection of fixed fire protection systems and equipment is the responsibility of trained engineers in the Engineering Department (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 1.0d). | | |
| | | A1-6: The Fire Control Supervisor is responsible for seeing that operating plant personnel and the fire brigade receive fire fighting training, critiquing fire drills, selection of manual fire fighting equipment, and reviewing and evaluating work activities for potential transient fire loads (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 1.0d). | | |
| | | A1-7: The Fire Control Supervisor is responsible for implementing a program for indoctrination of all plant contractor personnel in appropriate administrative procedures which implement the fire protection program, and the emergency procedures relative to fire protection. In addition, he is responsible for implementing a program for instruction of plant personnel on the proper handling of accidental events such as flammable liquid spills with regard to fire protection (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 1.0d). | | |
| | | A1-8: RG&E employs a Fire Protection Engineer who is a graduate engineer with a minimum of six years experience of which at least three are in fire protection engineering. Outside fire protection consultants are utilized to supplement his skills (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 2.0a). | | |

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| | | A1-9: Testing of the Fire Protection Systems is done by the Results and Tests personnel, the Fire Control Supervisor, or by qualified contractor personnel. Maintenance is done by Maintenance Department personnel or qualified contractor personnel. All of these personnel are qualified by training and experience to do this work. (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization 2.0a) | | Operations personnel perform required fire system testing for plant systems along with additional testing which is performed under the Fire Marshall's supervision. |
| A.2 <u>Design Bases</u> | | | | |
| The overall fire protection program should be based upon evaluation of potential fire hazards throughout the plant and the effect of postulated design basis fires relative to maintaining ability to perform safety shutdown functions and minimize radioactive releases to the environment. | The fire hazards analysis (Section 4.0 to the FPE) evaluates potential fire hazards. Plant emergency procedures are based on maintaining the plant in a safe condition (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-5). | | The licensee has performed a fire hazards analysis and has proposed certain modifications to improve the fire protection program. In addition, we have concluded that the licensee should implement certain evaluations or improvements related to the fire protection program. Additional evaluation of incomplete items will be necessary before we can conclude that the overall fire protection at the Ginna facility will satisfy the provisions of BTP 9.5-1 and Appendix A thereto. (RG001680, FP SER dated 2/14/79, Section 8) | Specific modifications and evaluations were performed and are identified in subsequent sections to this table. |
| | | | Based on our review, we conclude that all of the incomplete items in the FPSE, except the design of the dedicated shutdown capability, have been acceptably resolved subject to implementation of the approved modifications. Safe Shutdown will be resolved under 10CFR50.48 and Appendix R. (RG001680, FP SER Sup. 1, dated 12/17/80, p. 6) | See the FPPR report for a summary of the current plant fire hazard analysis and the current Appendix R Safe Shutdown Analysis. |
| A.3 <u>Backup</u> | | | | |
| Total reliance should not be placed on a single automatic fire suppression system. Appropriate backup fire suppression capability should be provided. | In all areas where automatic suppression systems are or will be provided, adequate manual suppression equipment including hose stations and portable fire extinguishers are available (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-5). | | Interior hose stations are provided to protect all areas of the plant except containment, the standby auxiliary feedwater pump room, and the 293' elevation of the auxiliary (should be intermediate) building (SER Sec 4.3.1.4). The licensee will perform a hose stretch test and provide additional modification as necessary to assure that all points in safety related areas and other areas which contain major fire hazards are covered (SER Sec 4.3.1.4). (RG001680, FP SER dated 2/14/79) | See Fire Response Plans (FRPs) for current locations of manual fire suppression equipment.<br><br>Design Analysis DA-ME-94-004 was completed and it documented the adequacy of installed hose reels at Ginna Station. This effort included the referenced hose stretch test. |

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| | | | A manual hose station on each level of the reactor containment will be provided so that all hazards in the area can be reached by at least one effective hose stream. (RG001680, FP SER dated 2/14/79, Section 5.1.6) | Two manual hose stations were provided on each level of containment per EWR 1833. |
| | | | We find that the type and distribution of portable fire extinguishers conform to the provision of Appendix A to BTP 9.5-1. (RG001680, FP SER dated 2/14/79, Section 4.3.3) | |
| A.4 Single Failure Criterion | | | | |
| A single failure in the fire suppression system should not impair both the primary and backup fire suppression capability. For example, redundant fire water pumps with independent power supplies and controls should be provided. Postulated fires or fire protection system failures need not be considered concurrent with other plant accidents or the most severe natural phenomena.<br><br>The effects of lightning strikes should be included in the overall plant fire protection program. | The fire hazards analysis (Section 4.0 to the FPE) addresses single failure criteria for fire suppression systems. To reduce the extent of a system outage for maintenance or due to system failure, two additional sectional isolation valves will be installed in the turbine building loop at column line 5 and B and in the feed form the service building at column lines 4 and C. When modifications are made in the auxiliary building and intermediate building to provide water spray systems, isolation valves will be provided for the standpipe systems. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-6 and 4.15-3). | In response to NRC request, RG&E performed a failure analysis to verify that single failure does not impair the primary and backup fire suppression capabilities. This evaluation considered failures in suppression systems, the fire detection system, and sources of power for these systems.<br><br>(RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 3).<br><br>All fixed suppression systems will be fed separately from the hose stations in an area. A secondary water supply and isolation valves will be installed where necessary so that all hoses in a given building cannot be out of service from one break or other event (RG002065, RG&E/NRC, 9/28/79, Attachment A, p.1) | The interior loop main is provided with valves that subdivide the loop into a number of sections so that single sections can be isolated without impairing the entire loop. However, locations exist where isolation of a single section could impair the availability of many interior hose stations. E3a-1: Appropriate modifications will be provided to prevent isolation of a section of fire water piping system from causing the loss of both the fixed suppression and manual hose coverage for the same area (RG001680, NRC FP SER, 2/14/79, Sections 3.1.40 and 4.3.1.3). | Modifications performed under EWR 1833. |
| | The plant structure and electrical equipment is grounded and lightning protection is provided for the facade which is the highest point of the plant (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-6). | | | |
| A.5 Fire Suppression Systems | | | | |

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| Failure or inadvertent operation of the fire suppression systems should not incapacitate safety-related systems or components. Fire suppression systems that are pressurized during normal plant operation should meet the guidelines specified in APCSB Branch Technical Position 3-1, "Protection Against Postulated Piping Failures in Fluid Systems Outside Containment." | Fire suppression systems outlined in the fire hazards analysis will include as planned modifications the protection of safety related systems and components from unacceptable damage from failure or inadvertent operation. The modifications include installation of water spray shields over the control rod drive motor control center and switchgear (intermediate building north zone 3, 253' elevation); provision of adequate shielding for switchgear, MCCs, and other equipment subject to water damage in the auxiliary building at the 253' elevation; and installation of curbs around the manhole covers to the cable vaults below the diesel generator rooms. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-6, 4.2-7, 4.3-7, 4.5-2, 4.5-3). | In response to NRC request, RG&E performed an evaluation of FP system piping rupture or inadvertent FP system operation to assess potential impact on safety related equipment. The evaluation identifies that inadvertent operation of systems is not credible because the systems that will be installed will be manually operated. FP piping rupture in the DG Building, Auxiliary Building, and Intermediate was evaluated. Results of the evaluation indicated the following:<br>Intermediate Building B no impact;<br>Diesel Generator Building B Potential MCC damage due to flood, however, redundant equipment would be used for safe shutdown;<br>Auxiliary Building B RHR Room flooding could occur but RHR system not used for Hot Shutdown. | D3c-3: Water spray shields will be installed in the intermediate building over the control rod drive motor control center and switchgear, and in the auxiliary building over the bus 16 switchgear. Watertight manhole covers at the manholes between the diesel generator rooms and the vaults below have been provided (RG001680, NRC FP SER, 2/14/79, Sections 3.1.7, 3.1.14, 4.3.1.5, 5.3.6, 5.4.6, 5.5.6).<br><br>RG&E will also evaluate adverse effects from suppression system actuation in its on-going study to preserve the safe shutdown capability (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.5). | Water spray shields installed under EWR 1833.<br><br>Ginna references for documenting installation of the watertight manhole covers were not located, but their installations were verified via walkdown by the Fire Protection Engineer.<br><br>The suppression effects analysis to ensure safe shutdown capability is an Appendix R compliance issue. Reference Analysis DA-EE-2001-003 Rev. 0 and 1-DC-783-0428-14 Rev. 0. |
| | | The study concludes that it is reasonable to assume that a ruptured fire line that presents a potential flooding situation would be detected early enough to prevent flooding by supplementing the normal drain systems with portable pumps (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 4). (A5-2) | Safety Related equipment is mounted on pedestals and floor drains provided in these areas are generally adequate to carry off fire water and prevent S/R equip from being flooded. In areas such as the control room, where drains are not provided, fire water will be drained through the door openings. (RG001680, NRC FP SER, 2/14/79, Section 4.5). | Results of suppression effects were completed and reviewed. |
| | | | | Portable pump availability was also addressed under CATS 10048. |
| A.6 <u>Fuel Storage Areas</u> | | | | |
| Schedule for implementation of modifications, if any, will be established on a case-by-case basis | N/A | N/A | N/A | N/A |
| A.7 <u>Fuel Loading</u> | | | | |
| Schedule for implementation of modifications, if any, will be established on a case-by-case basis. | N/A | N/A | N/A | N/A |
| A.8 <u>Multiple-Reactor Sites</u> | | | | |

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| On multiple-reactor sites where there are operating reactors and construction of remaining units is being completed, the fire protection program should provide continuing evaluation and include additional fire barriers, fire protection capability, and administrative controls necessary to protect the operating units from construction fire hazards. The superintendent of the operating plant should have the lead responsibility for site fire protection. | N/A | N/A | N/A | N/A |
| A.9 Simultaneous Fires | | | | |
| Simultaneous fires in more than one reactor need not be postulated, where separation requirements are met. A fire involving more than one reactor unit need not be postulated except for facilities shared between units. | N/A | N/A | N/A | N/A |
| B. Administrative Procedures, Controls and Fire Brigade | | | | |
| B.1 Administrative Procedures for Fire Protection Systems and Personnel<br><br>Administrative procedures consistent with the need for maintaining the performance of the fire protection systems and personnel in nuclear power plants should be provided.<br><br>Guidance is contained in the following publications:<br>NFPA 4 - Organization for Fire Services<br>NFPA 4A - Organization for Fire Department<br>NFPA 6 - Industrial Fire Loss Prevention<br>NFPA 7 - Management of Fire Emergencies<br>NFPA 8 - Management Responsibility for Effects of Fire on Operations<br>NFPA 27 - Private Fire Brigades | Present practices for maintaining the performance of fire protection equipment and systems and station personnel are being translated into an expanded series of formalized procedures. These administrative procedures will be prepared by March 31, 1977 and implemented as soon as conditions allow (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-7). | | The licensee has provided a description of the of the elements of his administrative controls for fire protection organization, fire brigade training, controls over combustibles and ignition sources, the pre-fire plans and procedures for fighting fires, and quality assurance provisions. Subject to implementation of described enhancements and procedure updates, the plant conforms to NRC Guidance document, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," (RG001680, NRC FP SER, 2/14/79, Sections 3.0 and 6.0) | A description of current administrative controls applicable to the fire protection program are identified in the FPPR, section II. |

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| B.2 <u>Administrative Procedures to Prohibit Combustible Storage</u><br><br>Effective administrative measures should be implemented to prohibit bulk storage of combustible materials inside or adjacent to safety-related buildings or systems during operation or maintenance periods. Regulatory Guide 1.39, "Housekeeping Requirements for Water-Cooled Nuclear Power Plants," provides guidance on housekeeping, including the disposal of combustible materials. | An administrative procedure will be developed which will prohibit bulk storage of combustible materials inside or adjacent to safety related buildings and systems unless appropriate fire prevention measures are taken. This procedure will provide requirements for the use of flammable liquids cabinets, housekeeping practices, and cleanliness of specific station equipment. Station employees are trained in cleanliness control requirements as part of the fire protection training. There are also provisions for inspection duties, reporting of nonconforming conditions, and follow-up actions (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 5-8, 5-9, 5-10). | B2-1: Administrative controls have been established and will be upgraded to minimize the amount of combustibles that a safety related area may be exposed to. These controls govern the handling of and limitation on the use of combustibles, flammable and explosive hazards, HEPA and Charcoal filters, dry unused ion exchange resins or other combustible supplies in safety related areas, and assure that these items are not stored unnecessarily in safety related areas (RG009142, Ginna FRACQA submittal, 5/15/78, Control of Combustibles Section 1.0a, pg. 8) | Administrative controls have been established and will be upgraded to limit the amount of combustibles that a safety related area may be exposed to. These controls include: housekeeping procedures; periodic inspections of housekeeping practices; procedures and guidelines for use and storage of combustible materials, and a review of proposed work activities to identify potential transient fire loads to evaluate the need for additional fire protection provisions in the work activity procedure. Administrative procedures will be established to ensure all wood products used in safety related areas are fire retardant treated. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.32 and 6.3) | Administrative control and housekeeping procedures have been developed and remain in effect. See FPPR Report Section II. |
| B.3 <u>Administrative Control of Normal and Abnormal Conditions</u><br><br>Normal and abnormal conditions or other anticipated operations such as modifications (e.g., breaking fire stops, impairment of fire detection and suppression systems) and refueling activities should be reviewed by appropriate levels of management and appropriate special actions and procedures such as fire watches, temporary fire barriers implemented to assure adequate fire protection and reactor safety. In particular: | The Ginna Station PORC, composed of the Station Superintendent and his technical staff, has the responsibility of reviewing plant operations for potential safety hazards. Procedures for maintenance activities are written with consideration for inclusion of precautions for the use and control of combustible materials or equipment that may be an ignition source. Unusual plant conditions are reported to the Station Superintendent with assessments of conditions provided by the Shift Foreman and the assigned Duty Engineer. Control over impairment of fire detection and suppression systems for maintenance purposes is imposed by review and approval of by the Shift Forman and the Station Superintendent. Non-routine conditions which result from modifications are controlled by various levels of review prior to approval and implementation. Modifications involving electrical cables shall address proper location and routing of cables, tightness of connections and fastenings, physical integrity, identification of cables and adequacy of fire barriers and protective covers after modifications. Final review and evaluation of modifications by PORC is performed. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 5-10, 5-11, 5-12, 5-13, 5-14). | B3-1: Procedures for operation, maintenance, testing, and removal from service of FP systems and components have been written and are kept current (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 9, 10). | The licensee has described the organizational responsibilities for inspection, training, review of design changes, review of proposed work activities and the station documents that defined these and other responsibilities as related to plant fire protection. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.32 and 6.1) | Procedures are developed and are controlled under the Fire Protection Program. See FPPR Report Section II. |

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| B.3.a Administrative Control of Ignition Sources<br><br>Work involving ignition sources such as welding and flame cutting should be done under closely controlled conditions. Procedures governing such work should be reviewed and approved by persons trained and experienced in fire protection. Persons performing and directly assisting in such work should be trained and equipped to prevent and combat fires. If this is not possible, a person qualified in fire protection should directly monitor the work and function as a fire watch. | Work involving ignition sources is performed under the control of a procedure requiring and open flame, welding, and grinding permit. Each job requiring a permit is reviewed by an assistant to the Maintenance Engineer, who provides instructions as to the fire equipment to be provided at the work area and the special precautions to be taken. A fire watch who has received training in controlling work area fire hazards and providing fire protective actions if needed is assigned to each job requiring this permit (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 5-14, 5-15). | B3a-1: Administrative controls have been instituted to protect safety related equipment from fire damage or loss resulting from work involving ignition sources such as welding, cutting, grinding or open flame work. Smoking or other ignition sources are prohibited in certain areas. Leak testing is accomplished by utilizing a rotameter, pressure decay, or equivalent methods. All cutting, welding, grinding, or open flame work is authorized through an open flame, welding, and grinding permit. In all safety related areas, before issuing the permit, the area where the work is to be performed is inspected to establish the necessary special precautions to be performed before, during and after the permit work is done. The responsible foreman will ensure that all necessary precautions are taken. A fire watch is required for all hot work except in designated shops and training areas. (RG009142, Ginna FRACQA submittal, 5/15/78, Control of Ignition Sources Section 3.0, p. 9, 10) | G1-1: Administrative controls have been established to protect safety related equipment from fire damage or loss resulting from hot work. These controls include hot work permits, posting of a fire watch during such work, and the prohibition of smoking in safety related areas and in areas containing flammable or potentially explosive materials. Administrative procedures will be established to ensure that before issuing the open flame, welding and grinding permit, a trained foreman or supervisor will survey the area and establish that the criteria outlined in the referenced SER are met (RG001680, NRC FP SER, 2/14/79, Sections 3.1.45 and 6.4). | Procedure Nos. A-202 and A-905 govern hot work inside the protected area.<br><br>Smoking is not permitted. See FPPR Report Section II. |
| B.3.b Administrative Control of Leak Testing<br><br>Leak testing and similar procedures, such as air flow determination, should use one of the commercially available aerosol techniques. Open flames or combustion generated smoke should not be permitted. | Use of open flames or combustion generated smoke for leak testing or air flow determinations is not a practice at Ginna Station. Present practice is to use an aerosol and a chemically generated fog. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-15) | B3b-1: Administrative controls will be established to prohibit the use of open flame or combustion generated smoke for leak testing (RG009142, Ginna FRACQA submittal, 5/15/78, Control of Ignition Sources Section 3.0, p. 9). | Administrative controls will be established to prohibit the use of open flame or combustion generated smoke for leak testing (RG001680, NRC FP SER, 2/14/79, Sections 3.1.33 and 6.4) | Administrative controls are established as part of the Fire Protection Program. See FPPR Report Section II. |

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| B.3.c Administrative Control of Combustibles in Safety-related Areas<br><br>Use of combustible material, e.g., HEPA and charcoal filters, dry ion exchange resins or other combustible supplies, in safety-related areas should be controlled. Use of wood inside buildings containing safety-related systems or equipment should be permitted only when suitable non-combustible substitutes are not available. If wood must be used, only fire retardant treated wood (scaffolding, lay down blocks should be permitted). Such materials should be allowed into safety-related areas only when they are to be used immediately. Their possible and probable use should be considered in the fire hazard analysis to determine the adequacy of the installed fire protection systems. | An administrative procedure will be developed which will control the use of combustible material in areas with safety related items. It will address the present practice of transferring HEPA and charcoal filters from warehouse storage to the areas where they are used, immediately prior to their installation, and immediately following removal after use, immediate packaging and transfer outside areas with safety related items. It will address the present practice of leaving damp ion exchange resin containers unopened until the time of their charging into ion exchanger vessels. It will address the present practice of purchasing all lumber as fire retardant treated or otherwise painting with fire retardant paint. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-15). | B3c-1 through B3c-5: Administrative controls have been established and will be upgraded to minimize the amount of combustibles that a safety related area may be exposed to. These controls govern the handling of and limitation on the use of combustibles, flammable and explosive hazards, HEPA and Charcoal filters, dry unused ion exchange resins or other combustible supplies in safety related areas, and assure that these items are not stored unnecessarily in safety related areas. Also, these controls govern the transient fire loads during maintenance and modifications, the removal of waste and debris or other combustibles resulting from the work activity, periodic inspection for accumulation of combustibles, all wood used in safety related areas to assure that it is treated with flame retardant except for large timbers. (RG009142, Ginna FRACQA submittal, 5/15/78, Control of Combustibles Section 1.0 a through e, p. 8) | Administrative controls have been established and will be upgraded to limit the amount of combustibles that a safety related area may be exposed to. These controls include: housekeeping procedures; periodic inspections of housekeeping practices; procedures and guidelines for use and storage of combustible materials, and a review of proposed work activities to identify potential transient fire loads to evaluate the need for additional fire protection provisions in the work activity procedure. Administrative procedures will be established to ensure that all wood products used in safety related areas such as boxes, staging forms, construction lumber, shelves and benches are fire retardant treated. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.32 and 6.3) | Administrative procedures for controlling combustible material in safety related areas have been prepared and are maintained under the Fire Protection Program. See FPPR Report Section II. |
| B.4 Fire Brigade Self Sufficiency<br><br>Nuclear power plants are frequently located in remote areas, at some distance from public fire departments. Also, first response fire departments are often volunteer. Public fire departments response should be considered in the overall fire protection program. However, the plant should be designed to be self-sufficient with respect to the fire fighting activities and rely on the public only for supplemental or backup capability. | The response by public fire departments in the vicinity of Ginna Station has been considered in the Fire Emergency Plan. The station is designed with fixed fire detection and suppression systems, portable fire fighting equipment is provided. Station personnel are trained such that the station can extinguish or contain a fire in a fire area, with public response considered as supplemental or backup capability. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-16). | B4-1: The Ginna Station on duty Shift Foreman is the Fire Brigade Captain. The fire brigade captains duties are spelled out in SC-3 Plant Operating Procedures. Members of the brigade are the two Auxiliary Operators. These men are backed up by certain shop personnel and H.P. personnel as available. (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization, Section 1.0f, p. 2). (Commitment Revised)<br><br>B4-2: The plant fire brigade will consist of three men; brigade captain, hoseman, and backup hoseman (RG009185, RG&E/NRC, 12/13/77, Attachment A; RG010661, RG&E/NRC, 6/26/78). (Commitment Revised)<br><br>B4-4: RG&E will provided five equally trained fire brigade members with at least two members having additional leadership training (RG001838, RG&E/NRC, 5/25/79). | A minimum of five trained fire brigade members will be on site at all times except for an unexpected absence of a Fire Brigade member. Such an unexpected absence should be a rare occurrence and shall only relieve the minimum requirement of five members for two hours or less. (RG002307, NRC SER approving Amend 30 to POL, 1/23/80, pg. 2) | ND-FPP was revised to state the five man brigade is required as described in section 9.5.1.2.5.2 of the UFSAR. |

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| B.5 Fire Brigade Organization, Training and Equipment<br><br>The need for good organization, training, and equipping of fire brigades at nuclear power plant sites requires effective measures be implemented to assure proper discharge of these functions. The guidance is Regulatory Guide 1.101, "Emergency Planning for Nuclear Power Plants," and should be followed as applicable. | In order to assure the proper discharge of fire protective functions, station personnel are trained and fire fighting equipment is provided. Nevertheless, an expanded series of implementing procedures for training and equipment readiness is being developed using guidance from RG 1.101 and NUREG-0050. This will include a discussion of the fire fighting organization, its components and the training for each group of station personnel. Fire watch training provides individuals with the necessary training to perform those duties and provide the desired protection. General employee training provides the basic principles of fire and how to eliminate them, and the use of extinguishers. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-16). | Procedures have been established to cover notification of a fire, fire emergency procedures, and coordination of fire fighting activities with off site fire departments (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Fighting Procedures, p. 11-12). | Procedures have been established to prescribe the action to be taken by the individual discovering the fire, the control room operators, and the members of the fire brigade. A written agreement with the local fire company is maintained to assure adequate support for a fire emergency. (RG001680, NRC FP SER, 2/14/79, Section 6.5). | Procedures have been developed and controlled under the Fire Protection Program. See FPPR Section II. |
| | | B5-3: RG&E will establish documented prefire plans (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P25; RG010682, RG&E/NRC, 9/1/78). | Plans covering fire fighting strategies for safety related areas and areas presenting a hazard to safety related equipment will be developed and documented (RG001680, NRC FP SER, 2/14/79, Sections 3.1.34 and 6.5). | FRPs developed under EWR 10116 and include drawings and the FRP set of plant procedures. |
| | | B5-4: RG&E will develop a fire brigade organizational chart (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P27; RG010682, RG&E/NRC, 9/1/78). | An organizational chart will be developed delineating the fire brigade members' responsibilities associated with the prefire plans (RG001680, NRC FP SER, 2/14/79, Sections 3.1.34 and 6.5). | Organizational Chart developed under EWR 10116. |
| | | B5-5: RG&E will develop and implement a procedure for off-duty fire brigade recall (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P30; RG010682, RG&E/NRC, 9/1/78). | Station procedures have been established to provide for the recall of off duty fire brigade members, to assist the on shift brigade in the event of a fire emergency (RG001680, NRC FP SER, 2/14/79, Sections 3.1.35 and 6.5). | Procedures have been established and are maintained as part of the Fire Protection Program. See FPPR report Section II. |
| | | Fire brigade equipment is provided at various locations throughout the plant. Spare extinguishers are available in the maintenance shop (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 6).<br><br>B5-1: A suitable, centrally located, fire fighting equipment storage area should be provided for special purpose and spare fire fighters equipment. This area should be readily accessible at all times. (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P21; RG010682, RG&E/NRC, 9/1/78) | A suitable, centrally located, fire fighting equipment storage area will be provided for special purpose and spare fire fighters equipment. This area will be readily accessible at all times. (RG001680, NRC FP SER, 2/14/79, Section 3.1.28) | PCR 99-040 completed required renovations to provide a centrally located fire brigade equipment room which allowed the equipment to be consolidated into one area.<br><br>Procedure SC- 3.15.15 was also revised to reflect these upgrades. The station maintains an alternate equipment location in the fully equipped Site Support Emergency Vehicle (SSEV).<br><br>These changes were implemented as part of the upgrade of the fire brigade personnel equipment for the use of bunker gear. |

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| | | B5-2: RG&E should provide the following special purpose fire fighting equipment in addition to existing equipment: two 2 1/2" double female adapters, a 5000 CFM explosion proof smoke ejector, a heat sensing device, a hydrant curb box key, and six sprinkler wedges (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P22; RG010682, RG&E/NRC, 9/1/78). | RG&E will provide the following special purpose fire fighting equipment in addition to existing equipment: two 2 1/2" double female adapters, a 5000 CFM explosion proof smoke ejector, a heat sensing device, a hydrant curb box key, and six sprinkler wedges (RG001680, NRC FP SER, 2/14/79, Section 3.1.27). | Procedure SC- 3.15.15 was revised to include this equipment which was either already listed or was located in the FP office area. |
| B.5.a <u>Fire Brigade Organization and Responsibilities</u><br><br>Successful fire fighting requires testing and maintenance of the fire protection equipment, emergency lighting, and communication as well as practice as brigades for the people who must utilize the equipment. A test plan that lists the individuals and their responsibilities in connection with routine tests and inspections of the fire detection and protection systems should be developed. The test plan should contain the types, frequency, and detailed procedures for testing. Procedures should also contain instructions on maintaining fire protection during those periods when the fire protection system is impaired or during periods of plant maintenance, e.g., fire watches or temporary hose connections to water systems. | As part of the series of implementing procedures being developed with guidance form RG 1.101, there will be a discussion of provisions for periodic inventory inspection, testing, calibration and maintenance of systems equipment and instrumentation, with referenced detailed procedures. It will list personnel with their responsibilities for the duties involved, and the frequency in which they will be performed. Included in the series will be a procedure to reflect the present practices on maintaining fire protection during periods when a fire protection system is impaired. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-17). | B5-1: Procedures for operation, maintenance, testing, and removal from service of FP systems and components have been written and are kept current (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 9 and 10). | | Procedures for operation, maintenance, testing and removal from service of F. P. systems and components have been established and are maintained and controlled under the Fire Protection Program. See FPPR report Section II. |

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| B.5.b Fire Brigade Training<br><br>Basic training is a necessary element to effective fire fighting operation. In order for a fire brigade to operate effectively, it must operate as a team. All members must know what their individual duties are. They must be familiar with the layout of the plant and equipment location and operation in order to permit effective fire fighting operations during times when a particular area is filled with smoke or insufficiently lighted. Such training can only be accomplished by conducting drills several times a year (at least quarterly) so that all members of the fire brigade have had the opportunity to train as a team, testing itself in the major areas of the plant. The drills should include the simulated use of equipment in each area and should be preplanned and post-critiqued to establish the training objective of the drills and determine how well these objectives have been met. These drills should periodically (at least annually) include local fire department participation where possible. Such drills also permit supervising personnel to evaluate the effectiveness of communications within the fire brigade and with the on-scene fire team leader, the reactor operator in the Control room, and the off-site command post. | Present members of the fire brigade team receive training and participate in monthly fire drills. Training of the fire brigade will be expanded to provide more equipment training, procedure training and team training. The first will provide classroom and hands-on training in fire fighting techniques and equipment. The second will provide the fire brigade the necessary classroom training in the procedures for immediate actions in the various areas of the plant, and the notification, assessment and subsequent actions. Thirdly, team training will provide walk-through training in the above, with emphasis on individual members becoming familiar with their particular duties. Drills which simulate use of equipment in the various areas will be preplanned and post-critiqued, and plans to include local fire department participation will be included. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-18). | B5b-1 through B5b-6: The fire brigade training program consists of classroom instruction, practice in fire fighting and fire brigade drills. The classroom instruction is provided quarterly and includes instruction in the types of fires that could occur in the plant and their particular hazards, location and use of the plant's fire fighting equipment; and fire fighting strategies and techniques. Annually, brigade members participate in training sessions in actual fire extinguishment; and at quarterly intervals the station conducts preplanned fire drills (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Brigade Training, pp. 5-7; RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 6; RG008784, NRC Site Evaluation Visit, 7/20/78, Item P24; RG010682, RG&E/NRC, 9/1/78).<br>B5b-8: The fire brigade training program should be upgraded to include instruction in rescue practices, ladder handling, and forcible entry methods (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P29; RG010682, RG&E/NRC, 9/1/78).<br>Fire brigade captains should receive advanced training in leadership and tactics, encompassing: critical factor analysis, fire action plan, command decisions, coordination, and fire control tactics (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P29; RG010682, RG&E/NRC, 9/1/78). | The fire brigade training program consists of classroom instruction, practice in fire fighting and fire brigade drills. The licensee has proposed to expand the training program to include: instruction in rescue practices, ladder handling, forcible entry methods, and advanced training in fire fighting tactics for brigade leaders.<br><br>B5b-4: Quarterly fire drills will be conducted for each shift brigade, of which one annually will be performed on a "back-shift" for each shift brigade. Subject to implementation of the above, fire brigade training is acceptable. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.31 and 6.2). | Training and drills are conducted as defined in the Fire Protection Program Plan. See FPPR report Section II. |
| B.5.c Fire Brigade Coverage and Coordination<br><br>To have proper coverage during all phases of operation, members of each shift crew should be trained in fire protection. Training of the plant fire brigade should be coordinated with the local fire department so that responsibilities and duties are delineated in advance. This coordination should be part of the training course and implemented into the training of the local fire department staff. Local fire departments should be educated in the operational precautions when fighting fires on nuclear power plant sites. Local fire departments should be made aware of the need for radioactive protection of personnel and the special hazards associated with a nuclear power plant site. | Presently fire protection training is extended to all operations personnel, of which certain personnel for each shift participate as members of the Fire Brigade. As part of the fire brigade training, on at least an annual basis, the local fire department will be included in walk-through training to coordinate the efforts of the two and develop in advance a clear understanding of the delineated responsibilities and duties involved in escalation of fire response actions. Fire department familiarization training will be expanded to further stress instructions to personnel from off-site fire departments in the station layout and its fire protection provisions, to make them aware of the operational precautions when fighting fires which are peculiar to the nuclear aspects of the plant, and to educate them in the need for radiation protection of personnel. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-18). | | The fire brigade training program consists of classroom instruction, practice in fire fighting and fire brigade drills. The licensee has proposed to expand the training program to include: instruction in rescue practices, ladder handling, forcible entry methods, and advanced training in fire fighting tactics for brigade leaders.<br><br>B5b-4: Quarterly fire drills will be conducted for each shift brigade, of which one annually will be performed on a "back-shift" for each shift brigade. Subject to implementation of the above, fire brigade training is acceptable. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.31 and 6.2). | Training and drills are conducted as defined in the Fire Protection Program Plan. See FPPR report Section II. |

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| | | Local fire apparatus and volunteer firemen are allowed entrance into the plant after proper authorization. The command and supervision of off-site fire departments rests with the fire brigade captain (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 8). | | Responsibilities and procedures are as defined in the Fire Protection Program Plan. See FPPR report section II. |
| B.5.d. Applicable NFPA Codes for Fire Brigades<br><br>FPA 27, "Private Fire Brigade," should be followed in organization, training, and fire drills. This standard also is applicable for the inspection and maintenance of fire fighting equipment. Among the standards referenced in this document, the following should be utilized: NFPA 194, "Standard for Screw Threads and Gaskets for Fire Hose Couplings," NFPA 196, "Standard for Fire Hose," NFPA 197, "Training Standard on Initial Fire Attacks," NFPA 601, "Recommended Manual of Instructions and Duties for the Plant Watchman on Guard." NFPA booklets and pamphlets listed on page 27-11 of Volume 8, 1971-72 are also applicable for good training references. In addition, courses in fire prevention and fire suppression which are recognized and/or sponsored by the fire protection industry should be utilized. | The organization of the Ginna Station Fire Brigade is discussed in the Ginna Station Fire Emergency Plan implementing procedures which is consistent with NFPA 27-1975, Recommendations for Organization, Training and Equipment of Private Fire Brigades. Further guidance in NFPA 197-1966, Training Standard in Initial Fire Attack as appropriate for a private fire brigade will be considered. Present training of the security force at the station is consistent with NFPA 601-1975, Recommendations for Guard Service in Fire Loss Prevention. The overall plan for testing, inspection and maintenance, being developed with guidance of RG 1.101 and will also make use of NFPA 27-1975 as applicable. During design of the Station and its fire protection provisions, fire protection standards which were current at that time were utilized. Present training includes obtaining assistance from a nearby municipal fire department training school in fire prevention and fire suppression. Other fire protection courses and reference material continue to be investigated. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-19). | B5d-1: The Ginna station licensed operators receive a bi-annual physical examination as required to maintain their operating license. Backup personnel do not receive this examination (RG009142, Ginna FRACQA submittal, 5/15/78, Fire Protection Organization, Section 2.0b, pg. 3). (Commitment Revised)<br><br>RG&E will provide the necessary periodic physical examinations for all Fire Brigade Members (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Item P23). | B5d-2: Minimum physical qualification requirements for service in the fire brigade have been established and annual physical examination for each fire brigade member will be provided (RG001680, NRC FP SER, 2/14/79, Sections 3.1.18 and 6.1). | Physical qualification requirements for fire brigade members are defined in the Fire Protection Program Plan. See FPPR report section II. |
| C. Quality Assurance Program | | | | |

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| Quality Assurance (QA) programs of applicants and contractors should be developed and implemented to assure that the requirements for design, procurement, installation and testing and administrative controls for the fire protection program for safety related areas as defined in this Branch Position are satisfied. The program should be under the management control of the QA organization. The QA program criteria that apply to the fire protection program should include the following: | The Quality Assurance Program for Station Operation governs all activities which may affect safety related structures, systems, and components at Ginna Station. The Program, described in Supplement IV to the Technical Supplement Accompanying Application for a Full-Term Operating License, applies to such activities as modification, maintenance, inspection, test and training. At present, the Quality Assurance Program is applied to Seismic Category I structures, systems and components since all safety related structures, systems and components at Ginna are designed to Seismic Category I standards. | C-1: The QA program assures that the requirements for design, procurement, installation, testing, and administrative controls for the fire protection program for safety related areas are satisfied. The QA program is under the management control of the QA organization. This control consists of (1) formulating and/or verifying that the fire protection QA program incorporates suitable requirements and is acceptable to the management responsible for fire protection and (2) verifying the effectiveness of the QA Program for fire protection through review, surveillance, and audits. Performance of other fire protection program requirements are performed by personnel outside of the QA organization. The QA program for fire protection is part of the overall plant QA program. (RG009142, Ginna FRACQA submittal, 5/15/78, Quality Assurance pg. 13) | The design, procurement, installation, testing and administrative controls for the fire protection program will be controlled in accordance with RG&E's 10 CFR 50 Appendix B QA program, implementing the QA provisions contained in BTP 9.5-1 Appendix A (RG001680, NRC FP SER, 2/14/79, Sections 6.1and 6.6). | See Ginna Station Nuclear Directive ND-FPP and FPPR report section II. |
| C.1 <u>Design Control and Procurement Document Control</u> | | | | |
| Measures should be established to assure that all design-related guidelines of the Branch Technical Position are included in design and procurement documents and that deviations, therefore, are controlled. | The fire protection systems are categorized in the Ginna FFDSAR, Section 1.2, as being Seismic Category I. However, modifications or additions to fire protection systems will not be required to meet Category I standards. Thus, in the absence of other provisions, the existing Quality Assurance Program would not apply to modifications or additions to the fire protection systems. | | | |
| C.2 <u>Instructions, Procedures, and Drawings</u> | | C-2: RG&E meets the fire protection QA program criteria of Appendix A to BTP 9.5-1 implementing those fire protection | | |
| Inspections, tests, administrative controls, fire drills and training that govern the fire protection program should be prescribed by documented instructions, procedures or drawings and should be accomplished in accordance with these documents. | In view of the fact that safety related structures, systems and components are protected by the fire protection systems, portions of the Quality Assurance Program for Station Operations will be selected to assure that fire protection in safety related areas is maintained through requirements on design, procurement, installation, testing and administrative controls. | QA criteria as part of their QA program under 10 CFR 50 Appendix B as described in our submittal of February 24, 1977. It should be noted that not all elements of the 10 CFR 50 Appendix B program are applicable to fire protection. In addition, the fire protection program QA requirements are applied only to those systems and activities which are part of the fire protection program. Applicable measures may be found in the RG&E manuals. (RG009142, Ginna FRACQA submittal, 5/15/78, Quality Assurance pg. 13) | | |
| C.3 <u>Control of Purchased Material, Equipment and Services</u> | | | | |

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| Measures should be established to assure that purchased material, equipment, and services conform to the procurement documents. | Consistent with the guidance provided in Appendix A to USNRC BTP APCSB 9.5-1 dated August 23, 1976, Quality Assurance Requirements will be applied to those portions of the fire protection systems which are required to assure that the plant can be brought to a safe shutdown condition and to minimize the release of radioactivity from the plant. Table 5-1 (to the FPE), entitled Quality Assurance Program Governing Fire Protection of Safety Related Structures, Systems and Components, provides for each QA Program Criterion of the BTP, a summary description of the extent to which the Ginna QA Program for Station Operation is applicable to the fire protection program. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 5-19, 5-20, 5-21) | | | |
| C.4 Inspection | | | | |
| A program for independent inspection of activities affecting fire protection should be established and executed by, or for, the organization performing the activity to verify conformance with documented installation drawings and test procedures for accomplishing the activities. | | | | Audit results are reported to the Site Vice President and the Plant Manager, Ginna Station. |
| C.5 Test and Test Control | | | | |
| A test program should be established and implemented to assure that testing is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. The tests should be performed in accordance with written test procedures; test results should be properly evaluated and acted on. | | | | |
| C.6 Inspection, Test and Operating Status | | | | |
| Measures should be established to provide for the identification of items that have satisfactorily passed required tests and inspections. | | | | |
| C.7 Non-Conforming Items | | | | |
| Measures should be established to control items that do not conform to specified requirements to prevent inadvertent use of installation. | | | | |
| C.8 Corrective Action | | | | |

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| Measures should be established to assure that conditions adverse to fire protection, such as failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible material and non-conformance are promptly identified, reported and corrected. | | | | |
| C.9 Records | | | | |
| Records should be prepared and maintained to furnish evidence that the criteria enumerated above are being met for activities affecting the fire protection program. | | | | |
| C.10 Audits | C10-1, C10-2: The QA Engineer is responsible for assuring the effective implementation of the fire protection program by planned inspection and scheduled surveillance. This effort is supplemented by audits which are schedules at least every two years by the Manager of QA. The audit results are reported to the Vice President of Electric and Steam Production, Station Superintendent, Fire Protection Engineer, Corporate Fire Marshall, and to the Nuclear Safety Audit and Review Board. (RG009142, Ginna FRACQA submittal, 5/I5/78, Fire Protection Organization 1.0e, pg. 2) | | | |
| Audits should be conducted and documented to verify compliance with the fire protection program including design and procurement documents; instructions; procedures; drawings; and inspection and test activities. | | | | |
| D. General Guidelines for Plant Protection | | | | |
| D.I Building Design | | | | |
| D.I.a Plant Layout<br><br>Plant Layouts should be arranged to: | | | | |

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| 1. Isolate safety related systems from unacceptable fire hazards, and | The fire hazards analysis (Section 4.0 to the FPE) identifies the plant fire areas and the safe shutdown related equipment within each area. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 5-22). | D1a-6: RG&E commits to providing means of taking Ginna to cold shutdown following a major fire. (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Items P6, P7, P10). | RG&E is committed to take action on incomplete Item 3.2.1 - Safe Shutdown and Item 3.2.2 - Cable Separation. (RG001680, NRC FP SER, 2/14/79, Sections 3.2.).<br><br>The NRC considers the Safe Shutdown Analysis and Cable Separation to be open items which must be resolved via evaluation and compliance to Appendix R to 10 CFR 50. (RG002940, NRC FP SER Supplement 1, 12/17/80, letter pg 2 and Encl. 1, pg. 5, 6) | See the Ginna Station Appendix R Safe Shutdown Analysis (Volume 3 of the FPPR). |
| 2. <u>Fire Protection of Exposed Redundant Safety-related Systems</u><br><br>Alternatives: | | | | |
| a. Redundant safety related systems that are subject to damage from a single fire hazard should be protected by a combination of fire retardant coatings and fire detection and suppression systems, or | Locations where redundant systems and/or cabling are exposed to a single fire have, or will be provided with, adequate fire protection. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-22) | | | Ginna Station Appendix R alternate shutdown report submitted to NRC addressed this issue. |
| b. A separate system to perform the safety related function should be provided. | The following commitments were listed in the fire hazards analysis (Section 4.0 of the FPE) to ensure that redundant safety related systems were protected. Section D.1.j and Section F to this table identify additional commitments that were identified to improve plant fire protection: | | | |
| | | | | |
| | <u>Auxiliary Building:</u> | | | |
| | An automatic deluge water spray protection will be provided to protect areas where redundant trains of grouped cables in the Auxiliary Building Elevation 235'-8" Zone 1. This water spray system will be actuated by an early warning detection system (RG010540, RG&E Fire Protection Evaluation, 2/24/77,p. 4.2-5), | D3c-1: An automatic water deluge system (S01) will be installed in the Auxiliary Building basement for areas of heavy cable tray concentrations (RG002065, RG&E/NRC, 9/28/79).<br>Note: Commitment revised see below | Automatic deluge water suppression systems will be provided in the basement and the intermediate floors to protect areas where redundant trains of grouped electrical cables are exposed to damage from a single exposure fire (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.5, and 5.4.6).<br>Note: Commitment revised see below | EWR 1833 installed system: S01. In addition, EWR 1832 provided automatic system actuation capability. |
| | | The new automatic water suppression systems will conform to the provisions of applicable NFPA codes and will be automatically actuated in accordance with NFPA 13 and/or 15. (RG002621, RGE/NRC, 6/4/80) | Adequate protection is provided based on licensees commitment to comply with applicable design guidelines of NFPA 13 and 15 and to convert to automatic operation. (RG002940, NRC FP SER Supplement 1, 12/17/80, p. 2) | |

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| | | D1a-7: System S01will be converted to an automatic preaction system with closed head sprinklers (RG003690, RG&E/NRC, 11/19/81). | The proposed modification to convert system S01 to an automatic preaction system is acceptable. The installation will meet the provisions of NFPA 15 with the exception of the following: closed head sprinklers, heat collectors will be installed above heads greater than 16" below the ceiling, and preaction trim will be installed on the deluge valves (RG004229, NRC SER, 5/26/82). | System S01 was converted to a preaction system via revisions to EWR 1833. |
| | An automatic deluge water spray protection will be provided to protect redundant cables in the area adjacent to the Cable Tunnel in the Auxiliary Building Elevation 253'-0" Zone 2. This water spray system will be actuated by an early warning detection system. The switchgear, motor control center, and other equipment subject to water damage from water spray systems will be adequately shielded. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.2-7), | D2a-1, D3c-1: Automatic water deluge system protection (Systems S03, and S04) will be installed in the Auxiliary Building intermediate floor for areas of heavy cable tray concentrations (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 35; RG002065, RG&E/NRC, 9/28/79).<br>Note: Commitment revised see below<br><br>The new automatic water suppression systems will conform to the provisions of applicable NFPA codes and will be automatically actuated in accordance with NFPA 13 and/or 15. (RG002621, RGE/NRC, 6/4/80) | Automatic deluge water suppression systems will be provided in the basement and the intermediate floors to protect areas where redundant trains of grouped electrical cables are exposed to damage from a single exposure fire (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.5, and 5.4.6).<br>Note: Commitment revised see below<br><br>Adequate protection is provided based on licensees commitment to comply with applicable design guidelines of NFPA 13 and 15 and to convert to automatic operation. (RG002940, NRC FP SER Supplement 1, 12/17/80, p. 2) | EWR 1833 installed these systems: S03, and S04, and the spray shields for SWGR and MCC. In addition, EWR 1832 provided automatic system actuation capability. |
| | | D1a-7: Systems S01, S03 and S04 will be converted to preaction systems with closed head sprinklers (RG003690, RG&E/NRC, 11/19/81). | The proposed modification to convert the systems to automatic preaction systems is acceptable. The revised installations will meet the provisions of NFPA 15 with the exception of the following: closed head sprinklers, heat collectors will be installed above heads greater than 16" below the ceiling, and preaction trim will be installed on the deluge valves (RG004229, NRC SER, 5/26/82). | Systems S03 and S04 were converted to preaction systems via revisions to EWR 1833. |
| | Automatic water spray will be provided to protect the charcoal filters in the Auxiliary Building Elevation 253'-0" Zone 2 due to exposure of redundant cables. This water spray system will be actuated by the existing thermal detectors. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.2-8), | D1a-4, D4d-1: The factory installed water deluge system provided with the charcoal filter unit for the Auxiliary Building will be connected and will operate automatically (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 32; RG002065, RG&E/NRC, 9/28/79). | Additional fixed suppression system coverage will be provided for the charcoal filters in the auxiliary building (p 3-1, 4-6). RG&E will connect the factory-installed spray system provided with the charcoal filter unit of the auxiliary building ventilating system to a water supply controlled by an automatic deluge valve actuated by the existing heat detectors in the filter units (p. 4-8). (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.5, 4.4.2) | EWR 1086 connected the 1G charcoal filter with wiring changes for automatic operation (System S02).<br><br>There are two charcoal filter units in the Aux. Bldg. Suppression is provided for the 1G filters only. RG&E has evaluated this issue and determined that suppression on the other filters is not required. EWR 4327 addressed this issue. |
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| | Fire detection will be installed for equipment on the auxiliary building elevation 271/278'-4" Zone 3 (p. 4.2-11), and for the areas where water spray systems were proposed. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, Section 4.2). | All areas that contain safe shutdown equipment or cables will be provided with an early warning detection system. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 13; RG001562.<br>Note: Commitment revised see below<br><br>Detection will be provided in every area which contains safety related equipment. (RG001562, RG&E/NRC, 10/31/78, Response to RAI #77). | Additional fire detection systems will be provided in every area which contains safety related equipment. Auxiliary building areas include the safety injection pump area, basement cable trays, area adjacent to the cable tunnel entrance, and the operating floor. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.4.6). | Systems Z01, Z02, Z03 and Z04 were installed under EWR 1832B.<br><br>Suppression System S03 includes detection capability in the area of the cable tunnel entrance and was installed under EWR 1833. |
| | <u>Intermediate Building:</u> | | | |
| | Manually operated water spray will be provided to protect the grouped cables along the north and west walls of the Intermediate Building, Northern Zone, Elevation 253'-6" Zone 3(RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.3-6) | D2a-2: Protection of the containment cable penetration area in the Intermediate Building will be provided by manually operated water spray sprinkler systems (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 35).<br><br>D3c-1: Water deluge systems will be installed in the Intermediate Building for areas of heavy cable tray concentrations (RG002065, RG&E/NRC, 9/28/79).<br>Note: Commitment revised see below | Manual water spray systems will be provided to protect grouped cables in the northern part of the basement floor of the intermediate building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.5, and 5.5.6).<br>Note: Commitment revised see below | EWR 1833 installed System S15. |
| | | The new automatic water suppression systems will conform to the provisions of applicable NFPA codes and will be automatically actuated in accordance with NFPA 13 and/or 15. (RG002621, RGE RGE/NRC, 6/4/80) | Adequate protection is provided based on licensees commitment to comply with applicable design guidelines of NFPA 13 and 15 and to convert to automatic operation. (RG002940, NRC FP SER Supplement 1, 12/17/80, p. 2) | |
| | | D1a-7: System S15 will be converted to an automatic preaction system with closed head (RG003690, RG&E/NRC, 11/19/81). | The proposed modification to convert Systems S15 to automatic preaction system is acceptable. The revised installation will meet the provisions of NFPA 15 with the exception of the following: closed head sprinklers, heat collectors will be installed above heads greater than 16" below the ceiling, and preaction trim will be installed on the deluge valves (RG004229, NRC SER, 5/26/82). | System S15 converted to an automatic preaction system via revisions to EWR 1832B and 1833. |
| | The manually actuated water spray system and detection system protecting the turbine driven auxiliary feedwater pump oil tank will be extended to cover the turbine driven pump (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.3-6, 4.3-7), | | Coverage of the deluge system and the fire detection system which protect the turbine driven auxiliary feedwater pump oil tank will be extended to protect the pump itself (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.5, 5.5.6). | System S14 (sprinkler) was extended under EWR 1833. System S14 and Z22 (detection) were installed under EWR 1832B. |

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| | Early warning detection will be installed in the northern zone of the intermediate building elevation 253'-6" Zone 3 (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.3-6), | | Additional fire detectors will be provided in the area of grouped cables in the Intermediate Building northeast corner at the 253' elevation. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.5.6). | System S15 was installed under EWR 1832B and 1833. |
| | Detection will be installed in the filter exhaust ducts for the reactor containment purge charcoal filter units on the 315'-4" elevation of the intermediate building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.3-12), | | A fire detection system will be added to the intermediate building elevation 315' purge filter exhaust ducts and the reactor containment purge charcoal filters (RG001680, NRC FP SER, 2/14/79, Section 3.1.1). | Systems Z23 and Z24 were installed under EWR 1832B. |
| | | Detection will be provided in every area which contains safety related equipment. Intermediate building areas identified include: 253' north and south; 271' south; 278' North; and 298' north. (RG001562, RG&E/NRC, 10/31/78, Response to RAI #77). | Additional fire detection systems will be provided in every area which contains safety related equipment. Intermediate building areas identified in the SER include the 253' elevation - northeast corner; purge filter exhaust ducts on the 315' elevation; and the turbine driven AFW pump area. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.4.6). | In addition to EWRs referenced above, EWR 4176 installed upgraded smoke detection capability in the intermediate building.<br>Note: This EWR was performed for Appendix R, however, credit for this EWR must be taken to address the Appendix A commitment for providing detection in IB safety related areas. |
| | | | The licensee will establish the adequacy of fire resistance for those walls separating the north and south sections of the Intermediate Bldg or upgrade them. (RG001680, NRC FP SER, 2/14/79, Section 4.11). | Original Fire Hazards Analysis determined that a rated fire wall was not needed as well as the Appendix R submittal. |
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| | <u>Control Complex:</u> | | | |
| | An automatic water spray system actuated by a detector will be installed to protect redundant cable trays entering the Control Complex from the Cable Tunnel in the northwest corner of the Mechanical Equipment Room (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-4), | D1a-4, D3c-1: Hydraulically designed deluge systems will be installed in the Control Building mechanical equipment room heavy cable tray concentration area. (RG002065, RG&E/NRC 9/28/79). | Additional fixed water suppression system coverage will be provided for the Control Complex in the cable area in the northwest corner of the mechanical equipment room. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.5, 5.8.6) | System S06 was installed under EWR 1833. System is actuated by smoke detection installed under EWR 1832B. |
| | | | A fire detection system will be added in the control complex mechanical equipment room cable tunnel entrance (RG001680, NRC FP SER, 2/14/79, Section 3.1.1). | |
| | | The new automatic water suppression systems will conform to the provisions of applicable NFPA codes and will be automatically actuated in accordance with NFPA 13 and/or 15. (RG002621, RGE RGE/NRC, 6/4/80) | Adequate protection is provided based on licensee's commitment to comply with applicable design guidelines of NFPA 13 and 15 and to convert to automatic operation. (RG002940, NRC FP SER Supplement 1, 12/17/80, p. 2) | |

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| | Modifications to the ventilation system are planned to minimize the potential for flow of smoke and hot gases into the battery rooms from adjacent areas and between the battery rooms. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-6) | An air conditioning unit will be installed to supply supplemental cooling to the battery rooms. This a/c unit will be installed in the mech. equip room. In addition, 1 1/2 hour fire dampers will be installed in all wall openings, including ductwork, in the Battery Room. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 52).<br><br>A fan will be installed on the air inlet to the Battery Rooms (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item P5). | Each ventilation opening in all barriers will be protected by a 1 1/2 hour rated, automatic fire damper (RG001680, NRC FP SER, 2/14/79, Sections 3.1.11, 5.7.6, and 5.11.6). | A/C unit was originally installed under EWR 1100 and has since been upgraded under PCR 96-084.<br><br>Dampers were installed under EWR 1100. Dampers were also upgraded under EWR 4882. |
| | | To provide additional conservatism in the design, the amount of makeup air will be increased. A minimum factor of safety of 5 will be utilized in calculating the amount of makeup air required under worst case conditions (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Item P19). | RG&E will increase the amount of makeup air to provide a factor of safety of at least 5 under the worst condition. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.11, 4.4.4, and 5.7.6). | PCR 96-084 analysis verified required makeup air rate as noted. |
| | | Constant makeup air to the battery rooms is assured by a fixed makeup air damper and by the backup vent system. An engineering calculation will be performed to determine min damper setting. (RG002621, RGE/NRC, dated 6/4/80, Item 3.1.11) | The minimum air flow setting will be based on engineering calculations for the maximum H2 generation rate for the batteries. (RG002940, NRC FP SER, Sup. 1, dated 12/17/80, p 2). | |
| | | Air flow monitors will be installed in each of the station battery rooms and annunciate the loss of ventilation air flow in the Control Room (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Item P5 and RG002621, RGE/NRC, dated 6/4/80, Item 3.1.11). | F7-2: Ventilation airflow monitors will be provided in each of the Battery Rooms to alarm and annunciate the loss of air flow in either room (RG001680, NRC FP SER, 2/14/79, Sections 3.1.11, 4.4.4, and 5.7.6; RG002940, NRC FP SER Supplement 1, 12/17/80 pg. 2). | System was provided with required devices per a review of P&ID 33013-1868. |
| | The Battery Rooms are separated from other areas by a two hour barrier, except for the ceiling. The FHA outlines the requirements for this area. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, 5-47). | | Barriers that do not contain 3 hr ratings consist of the following: the 2 hr rated walls between the battery rooms and the mechanical equipment room. Fire barriers in the plant will be adequate to contain fires and is therefore, acceptable. (RG001680, NRC FP SER, 2/14/79, Section 4.11) | |
| | The FHA identifies that the existing 1 1/2 hr doors and the 2 hr barriers are adequate based on fire loading and smoke detection in the rooms. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, 4.4-6). | | Unprotected openings in the barriers enclosing the rooms, exposed structural steel, and the electrical cable tray in the "B" room containing redundant safety divisions exist. We will address the adequacy of fire protection for this area in a supplement to this report. (RG001680, NRC FP SER, 2/14/79, Section 5.7.6). | Battery room exposed structural steel supporting the floor above was provided with fire proofing under EWR 4175. |

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| | The existing total flooding Halon systems in the Cable Spreading/Relay Room and Computer Room will be converted to automatically actuate to protect redundant safe shutdown equipment in the Relay Room(RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-9, 4.4-11), | D1c-1, E4-1: The manually actuated Halon systems for the relay and computer rooms are to be upgraded to automatic operation. Both systems will have alarm and supervision in accordance with NFPA 12A. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 37). | The manually actuated total-flooding gas fire suppression systems in the relay/cable spreading room and the computer room will be converted to automatic operation (RG001680, NRC FP SER, 2/14/79, Sections 3.1.3, 4.3.2, and 5.9.6). | Systems S07 and S08 were converted under EWR 1833. Smoke detection for automatic operation was installed under EWR 1832B. Systems S07 and S08 were combined under PCR 96-125. |
| | | Either a manually operated water suppression system will be installed in the relay room or all cables in the relay room will be provided with an appropriate flame retardant coating. If a suppression system is installed, it will be isolated with a manual valve to prevent inadvertent operation. (RG001562, RG&E/NRC, 10/31/78, Enclosure 1, P35) | All cables in the relay room will be covered with a flame retardant coating or a manually operated suppression system will be installed. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.15 and 5.9.6). | Three manually operated water suppression systems, S09, S10 and S11, were installed under EWR 1833. |
| | | The water suppression system for the cable trays in the relay room will be a manual system. (RG002621, RGE/NRC, dated 6/4/80, Item 3.1.2). | Note: NRC SER supplement 1 item 3.1.2 does not specifically address the Relay Room manual suppression system that was installed. (See RG002940, NRC FP SER Sup. 1, dated 12/17/80, p 2) | |
| | The walls of the computer room have a 2-hour fire resistance rating. The ceiling of the computer room will be replaced with a one hour fire barrier and the combustibles in the room will be reduced to protect redundant safe shutdown related cable above the ceiling (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-10,11), | | RG&E will replace the existing computer room ceiling with a one hour rated assembly (RG001680, NRC FP SER, 2/14/79, Sections 3.1.6, 4.11, and 5.9.6).<br><br>The rating of barriers, including the ceiling, separating the Computer Room from the Relay Room will be upgraded to three hours or the combustibles in the Computer Room be reduced to the level that can be contained by the proposed barriers (RG001680, NRC FP SER, 2/14/79, Sections 3.1.38, 4.11, and 5.9.6).<br><br>Note: SER section 4.11 is not consistent, Computer Room ceiling 3 hr vs 1 hr. | A 1 hr ceiling was installed under EWR 1837 and unnecessary combustible materials were removed to the extent practical. The computer room is listed as a combustible control zone under Procedure No. FPS-16. |
| | The doors between the relay room and the computer room (F507) and the relay room and the stairway to control room (F502), will be replaced with B-labeled, 1-1/2 hour rated fire doors. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p.4.4-9) | | All the doors in the barriers enclosing the relay room will be replaced with 11/2 hour rated fire doors. (RG001680, NRC FP SER, 2/14/79, Sections 5.9.6).<br><br>Section 4.9.1 of the above SER calls for the door between the relay room and the computer room to be upgraded to a three hour labeled door. (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 16). | Fire doors F502 and F507 were installed under EWR 1837 and were verified to be three hour rated per a review of the fire door manual.<br><br>PCR 96-125 combined the MUX room and Relay room into one fire zone. |

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| | The supply and exhaust ducts to the computer room are provided with smoke dampers. Fire dampers will be installed in these ducts to retard spread of fire through the ventilation system. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-10) | Fire dampers will be installed in the supply and exhaust ducts for the Computer Room. Only smoke dampers currently exist. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 25). | Ventilation ducts to the computer room will be protected by fire dampers. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.9, and 5.9.6). | Fire dampers RR-117 and RR-120 through RR-123 were installed under EWR 2463. Fire damper RR-117 was removed under PCR 96-125 and the fire barrier opening was restored. RR-120 through RR-123 have been deactivated due to PCR 96-125 combining the fire areas. CA-2007-002861 |
| | The floor construction of the control complex is 6 inch reinforced concrete on unprotected structural steel. The steel prevents the floor from being 3 hour fire barrier. The roof of the control room is concrete on unprotected structural steel. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-1, 4.4-11) | RG&E is still evaluating structural steel requirements and is not yet in position to commit to the staff request (position P8) (RG009792, RGE/NRC, dated 9/22/78). | The licensee will conduct a study to determine what active and passive systems should be installed in high fire load areas to prevent structural failures that could jeopardize safe shutdown. (RG001680, NRC FP SER, 2/14/79, Sections 3.2.8). | |
| | | Failures of the control complex steel are prevented by the addition of automatic and manual suppression fixed fire suppression systems and smoke detection systems being installed. (RG002659, RGE/NRC, dated 6/30/80) | By letter dated 6/30/80, the licensee submitted the results of a study on the effects of fire on the structural integrity of exposed structural steel in areas of high fire load. A fire involving cable insulation, charcoal filters, or ordinary combustibles should be a slow developing fire and should not threaten the structural integrity of the exposed steel (i.e. in Control Complex areas). (RG003007, NRC FP SER, Supplement 2, dated 2/6/81) | Although not required by Appendix A, fire protection of structural steel was provided in the battery rooms for Appendix R purposes under EWR 4175. |
| | Early warning fire detection will be provided for the instrument cabinets in the control room (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-13), | F2-3, D1a-2: Each safety-related cabinet and console which is enclosed by an essentially complete and continuous surface will be provided with a fire detector. Interconnected consoles and panels will be provided with fire detectors appropriate to their physical characteristics (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item P4; RG008784, NRC Site Evaluation Visit, 7/20/78, Item P4; RG010682, RG&E/NRC, 9/1/78; RG001721, RG&E/NRC, 3/13/79, Attachment A Item 37). | A smoke detector will be installed in each safety related cabinet/console in the control room to provide early warning (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.10.6). | System Z19 was installed in the control room under EWR 1832B. Adequacy of system Z19 was documented under CATS 10040. |
| | | | The licensee will provide a 1-hour barrier between the kitchen area and the control room. (RG001680, NRC FP SER, 2/14/79, Section 3.149 and 5.10.6). | A wall was installed under EWR 1837. No RGE commitment document was located. |
| | Based on the fire loading and hazards analysis of the battery rooms and adjacent areas, the existing 1 1/2 hr rated doors and 2 hr walls are adequate to limit the spread of fire. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p 4.4-6) | | Fire hazards in the Mech. Equip Room and in the station battery rooms were reviewed against the fire rating of the walls and it was concluded that the walls are adequate to contain the fire hazards. (RG001680, NRC FP SER, 2/14/79, Section 4.11) | |
| | <u>Diesel Generator Bldg:</u> | | | |

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| | The metal enclosure separating the power cables from both diesel generators will be sealed at the floor in Cable Vault below DG-2 (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-5), | | D1j-9: The metal barrier between the power cables from both emergency generators located in the cable vault below generator B will be sealed at the floor (RG001680, NRC FP SER, 2/14/79, Sections 3.1.8 and 5.3.6). | This barrier was sealed under EWR 1850 and verified under EWR 4941 and later upgraded under PCR 2002-0018. |
| | In the DG-2 room cable vault, spray on type fire retardant coating will be applied to the power cable for both generators within five feet of the duct bank to the Auxiliary Building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-5), | | D1c-2, D3f-1: A flame retardant coating will be applied to the power cables for both diesel generators within 5 feet of the duct bank to the Auxiliary Building located in the cable vault below Diesel Generator Room B (RG001680, NRC FP SER, 2/14/79, Sections 3.1.15 and 5.3.6). | Installed under EWR 1832. |
| | Early warning detectors will be installed in the cable vaults below the diesel generators (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-3), | | An early warning fire detection system will be installed in the cable vault under each diesel generator room (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.3.6). | Systems Z20 and Z21 were installed under EWR 1832B. |
| | In the Diesel Generator Rooms, a curb will be installed around the manhole cover to prevent oil or water from entering the cable vault. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-3). | | A water tight cover for the manholes opening to each cable vault in the diesel generator rooms has been installed. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.14). | RG&E documents which identify that the FPE commitment was revised and that the manhole was sealed were not located but, based upon field walkdowns by the fire protection engineer, both vaults are provided with required covers. |
| | | RGE will provide protection commensurate with the hazard for the section of service water piping for the "A" diesel that passes through the "B" diesel room. (RG009792, RGE/NRC, 9/22/78, Attachment 1, Item P17) | The section of the service water piping for the "A" diesel which passes through the "B" diesel room will be protected to assure cooling of the "A" diesel in the event of a "B" diesel room fire. (RG001680, NRC FP SER, 2/14/79, Sections 5.3.6). | Protection for this piping section was provided under EWR 1833 and evaluated under DA-ME-2000-062. |
| | The diesel generators are protected by an open head deluge system. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-3). | The suppression systems covering the diesel generators will be changed from manual to automatic actuation. (RG010682, RGE/NRC, 9/1/78, Item P16; RG010682, RG&E/NRC, 9/1/78) | The existing manually actuated water spray system in each diesel generator room will be converted to an automatically actuated system. (RG001680, NRC FP SER, 2/14/79, Sections 5.3.6). | Systems S12 and S13 were converted to automatic operation actuated by heat detection under EWRs 1833 and 1832B. |
| | <u>Screen House:</u> | | | |
| | An automatically actuated water spray system will be installed over the redundant service water pump power cable trays directly below the switchgear in the Screen House Basement (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.6-3), | Hydraulically designed deluge systems will be installed in the Screen House basement heavy cable tray concentration area (RG002065, RG&E/NRC, 9/28/79). | D1a-4, D3c-1: A water spray system automatically actuated by an early warning detection system will be installed over the redundant power cable trays in the basement of the Screen House which are directly below the switchgear (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2 and 5.2.6). | System S17 was installed under EWR 1833. The system is automatically actuated by smoke detection installed under EWR 1832B. |
| | | The new automatic water suppression systems will conform to the provisions of applicable NFPA codes and will be automatically actuated. (RG002621, RGE/NRC, 6/4/80 p 2) | The system will conform to NFPA 13 and 15 and will be automatically actuated (RG002940, NRC FP SER Supplement 1, 12/17/80, Section 3.1.2 pg. 2). | |

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| | The gas meter-regulator station located in the Screen House Basement for the auxiliary boiler will be relocated outside the building away from redundant service water pump power cable trays (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.6-3), | | The gas meter-regulator station for the auxiliary boiler will be relocated outside the building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.13 and 5.2.6). | Gas meter was relocated under EWR 1834. |
| | To protect redundant service water pumps, the diesel fuel storage tank for the fire pump in the Screen House will be relocated to a safe outside location with a thermally operated shutoff valve where the fuel line enters the building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.6-6), | A curb will be provided for the diesel driven fire pump area to contain all of the fuel from a full day tank. In addition, the drain will carry this fuel to a buried holding tank with sufficient capacity to contain all the diesel fuel. The holding tank will be larger than the diesel fuel day tank. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 16 and 55). | Curbs will be installed in the screen house around the diesel fire pumps and oil storage tank. A drain will be installed in the curbed area to carry leaking diesel to a holding tank buried outside the building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.4, 4.3.1.2, 4.5 and 5.2.6) | Curbed area and drain/tank are each capable of holding the entire contents plus an additional 10%. These were installed under EWR 1834A. |
| | An automatic sprinkler system will be provided over the area enclosed by column lines 5 and 6, A and E in the Screen House to assure that a fire does not spread to more than one service water pump (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.6-6, 5-50), | F11-1, D1a-4: A standard automatic sprinkler system will be installed over the service water pumps in the Screen House (RG002065, RG&E/NRC, 9/28/79). | An automatic sprinkler system will be installed over the area where the fire pumps and service water pumps are located (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.2, 4.3.1.5, 5.2.6). | System S18 was installed in area of columns 5-6 and A-E under EWR 1833. The system is automatically actuated. |
| | | The new automatic water suppression systems will conform to the provisions of applicable NFPA codes and will be automatically actuated. (RG002621, RGE/NRC, 6/4/80) | The system is required to be automatically actuated (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 2) | |
| | Early warning detection will be installed in the area enclosed by column lines 5 and 6, A and E of the Screen House (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.6-6), | | Early warning fire detection will be installed in the area of the fire pumps and service water pumps in the screen house (RG001680, NRC FP SER, 2/14/79, Section 5.2.6). | System Z26 was installed under EWR 1832B. |
| | | Detection will be provided in every area that contains safety related equipment. Screen house basement and main floor areas were identified to contain safety related equipment. (RG001562, RGE/NRC, dated 10/31/78, response to RAI#78) | Fire detection systems will be added to the screen house basement and operating floor (RG001680, NRC FP SER, 2/14/79, Section 3.1.1). | System Z26 was installed under EWR 1832B. System S17 includes smoke detection and was installed under EWRs 1832B and 1833. |
| | | | The licensee will verify that the auxiliary boiler conforms to the applicable provisions of the current edition to NFPA 85, or identify and justify deviations. (RG001680, NRC FP SER, 2/14/79, Section 3.1.46, 5.2.6). | |
| | | The current issue of NFPA-85 has been reviewed and the auxiliary boiler unit has been inspected against this standard. Minor variations were noted. (RG002065, RGE/NRC, dated 9/28/79, Item 3.1.46) | The licensee discussed deviations of the auxiliary boiler from the current version of NFPA 85. We have reviewed the deviations and conclude that the present arrangement of the auxiliary boiler is acceptable. (RG003007, NRC FP SER, Supplement 2, dated 2/6/81) | |

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| | Cable Tunnel | | | |
| | The water spray system in the cable tunnel will be converted to automatic operation actuated by the existing smoke detection system. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.7-2) | D1a-5: The cable tunnel deluge system is presently actuated manually and will be converted to a fully automatic system (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 57, 64). | RG&E will modify the water spray system to be automatically actuated (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2 and 5.6.6) | System S05 was converted to automatic operation under EWR 1833 and heat detection capability is also provided by system Z05. |
| | | The new automatic water suppression systems will conform to the provisions of applicable NFPA codes and will be automatically actuated in accordance with NFPA 13 and/or 15. (RG002621, RGE RGE/NRC, 6/4/80) | Adequate protection is provided based on licensees commitment to comply with applicable design guidelines of NFPA 13 and 15 and to convert to automatic operation. (RG002940, NRC FP SER Supplement 1, 12/17/80, p. 2) | |
| | | | | |
| | A barrier will be provided at the tunnel entrance from the Intermediate Building to prevent inadvertent water spray system operation due to smoke infiltration (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.7-2), | | A barrier will be provided in the opening between the Intermediate building and the Cable Tunnel. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.8 and 5.6.6) | EWR 2940 installed the barrier. |
| | | | | |
| | Reactor Containment: | | | |
| | An existing television monitoring system is installed at each reactor coolant pump to detect a fire in these areas (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.1-3), | Detection will be provided in every area which contains safety related equipment. Safety related equipment is located in the containment area. (RG001562, RGE/NRC, dated 10/31/78, Response to RAI#77) | Early warning fire detection systems will be installed throughout the reactor containment (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.1.6). | Systems Z08, Z13, Z14, Z15, and Z16 were installed in the area of the RCPs under EWR 1832B. These systems are heat detection except Z16 which includes both heat and smoke detection.<br><br>CATS 10039 completed and DA-ME-2000-052 documented installed capability.<br><br>Z16 smoke detectors were upgraded under ECP-12-000198 |
| | Install a curb around the reactor coolant pumps to prevent an oil leak from spreading beyond the pump area (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.1-3) | D2a-4, D2a-5: Curbs around the Reactor Coolant Pumps to enclose an area large enough to contain all of the lubricating oil and a suppression system will be provided or an oil collection system will be installed (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 16, P3; RG001721, RG&E/NRC, 3/13/79, Attachment A Item 1).<br>Note: Commitment revised, see below | Curbs will be installed in reactor containment on the floor within the secondary shield walls. An oil collection system will be provided for each reactor coolant pump to contain lube oil and drain leaked oil to a safe place or a suppression system will be provided (RG001680, NRC FP SER, 2/14/79, Sections 3.1.4, 3.1.39, 4.5 and 5.1.6).<br>Note: Commitment revised, see below | |

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| | | A curb will be installed around the reactor coolant pump only if an automatic suppression system is installed. If an oil collection system is installed, no curbs are required. (RG001721, RGE/NRC, dated 3/13/79, Att. 1 FP SER Item 1.1.4). | N/A | Oil collection systems were installed under EWR 2462. In addition, Bechtel document ESM97-009, Rev.0 dated 2/9/98, re-evaluated RCP Lube Oil Collection System adequacy. |
| | | An oil collection system will be installed for the reactor coolant pumps (RG002248, RG&E/NRC, 12/18/79). | Based on the NRC's review, they conclude that RG&E's RCP oil collection system meets the fire protection guidelines (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 4). | |
| | | | | |
| | <u>Standby Aux Feedwater Bldg:</u> | | | |
| | A fire detector alarming in the main control room will be added in the standby auxiliary feedwater pump building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.10-3). | | A fire detector, alarming in the main control room will be installed in the Standby Auxiliary Feedwater Pump Building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.13.6). | System S52 was installed under ECP-13-000995. |
| | | | | |
| D.1.b <u>Fire Hazard Evaluation</u><br><br>In order to accomplish 1.a above, safety related systems and fire hazards should be identified throughout the plant. Therefore, a detailed fire hazard analysis should be made. The fire hazards analysis should be reviewed and updated as necessary. Additional fire hazards analysis should be done after any plant modification. | The fire hazards analysis performed is included in Section 4.0 of the Fire Protection Evaluation dated March 1977 (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-22). | | | Refer to Volume 1 of the FPPR for the current Fire Hazards Analysis. Design Analysis DA-ME-98-004 provides additional details. |
| D.1.c <u>Multiple Site Cable Spreading Rooms</u><br><br>Alternative guidance for constructed plants is shown in section F.3, "Cable Spreading Room." | | | | |

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| D.1.d Use of Interior Noncombustible Materials<br><br>Interior wall and structural components, thermal insulation materials and radiation shielding materials and sound-proofing should be non-combustible. Interior finishes should be non-combustible or listed by a nationally recognized testing laboratory, such as Factory Mutual or Underwriters' Laboratory, Inc. for flame spread, smoke and fuel contribution of 25 or less in its use configuration (ASTM E-84 Test, "Surface Burning Characteristics of Building Materials"). | Plant structural components meet this criterion. Interior finishes of some areas of the service building do not meet the 25 flame spread criteria, but they present no exposure to safe shutdown equipment and are protected by automatic sprinkler systems (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-22). | | | Refer to Volume 1 of the FPPR for the current Fire Hazards Analysis. |
| D.1.e Roof Construction<br><br>Metal deck roof construction should be non-combustible (see the building materials directory of the Underwriters' Laboratory, Inc.) or listed as Class I by Factory Mutual System Approval Guide. Where combustible material is used in metal deck roofing design, acceptable alternatives are: | All metal deck roofs were specified to be FM Class I, except for the Screen House. The Screen House roof is a metal deck supported by unprotected steel and is not Class I. The roof construction does not present a serious fire hazard. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 4.6-3, 4.6.7, 5-23) | | RG&E will conduct a study to determine what active and passive systems should be installed to control fires in high fire load areas to prevent structural failures that could jeopardize safe shutdown of the plant. This study will interface with the safe shutdown study and will be complete in December 1979 (RG001680, NRC FP SER, 2/14/79, Section 3.2.8). | |
| 1. Replace combustibles with non-combustible materials,<br>2. Provide an automatic sprinkler system, or<br>3. Provide ability to cover roof exterior and interior with adequate water volume and pressure. | | | RG&E's protection for the exposed structural steel in the vicinity of the hydrogen seal oil unit, turbine island and condenser pit, and in the Screen House does not meet Section III.G.2(a) of Appendix R to 10 CFR 50 (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3 and 4). | Upgrades were completed to the seal oil unit and turbine reservoir area under EWR 2928. Requirements for fire protection of structural steel in the Screen House was addressed as part of the Appendix R analysis. |
| | | | | |
| D.1.f Suspended Ceilings<br><br>Suspended ceilings and their supports should be of non-combustible construction. Concealed spaces should be devoid of combustibles. Adequate fire detection and suppression systems should be provided where full implementation is not practicable. | Plant areas meet this criteria (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-23). | | | No further action required. |

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| D.1.g Interior Transformers<br><br>High Voltage - High amperage transformers installed inside buildings containing safety related systems should be of the dry type or insulated and cooled with non-combustible liquid. Safety related systems that are exposed to flammable oil filled transformers should be protected from the effects of a fire by: | All inside 4160/480 transformers are dry type (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-23). | | | No further action required. |
| 1. Replacing with dry transformers that are insulated and cooled with non-combustible liquid; or<br>2. Enclosing the transformer with a three-hour fire barrier and installing automatic water spray protection. | | | | |
| D.1.h Exterior Transformers<br><br>Buildings containing safety related systems, having openings in exterior walls closer than 50 feet to flammable oil filled transformers should be protected from the effects of a fire by:<br>1. Closing of the opening to have fire resistance equal to three hours,<br>2. Constructing a three-hour fire barrier between the transformers and the wall openings, or<br>3. Closing the opening and providing the capability to maintain a water curtain in case of a fire. | Outside transformers are within 50 feet of openings in the Turbine Building. Transformers are adequately protected with fixed automatic water spray systems. No safety related systems are exposed to the transformers (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-24). | | | No further action required because the Turbine Building was identified as an area with no safety related equipment.<br><br>However, the Cable Tunnel contains safety related cables and has openings to the transformer area and an emergency exit hatch which was evaluated under PCR 98-066. The emergency exit hatch was sealed closed under PCR 2004-0022. |
| D.1.i Floor Drains<br><br>Floor drains, sized to remove expected fire fighting water flow should be provided in those areas where fixed water fire suppression systems are installed. Drains should also be provided in other areas where hand hose lines may be used if such fire fighting water could cause unacceptable damage to equipment in the area. | In general, floor drains are designed to handle existing water sources. Water will drain to lowest elevation through open stairwells. Protection from water damage will be provided for exposed equipment. Likewise, procedures will be developed to handle water removal related to post fire salvage operations. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-24) | Specific information relative to floor drain adequacy for safety-related areas is identified in RGE submittal to NRC dated 6/9/78. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 14(1) and 14(2)). | Safety related equipment is mounted on pedestals and floor drains provided in these areas are generally adequate to carry off fire water and prevent safety related equipment from being flooded with standing water. In areas such as the control room, where floor drains are not provided, fire water will be drained out through door openings (RG001680, NRC FP SER, 2/14/79, Section 4.5). | No further action taken.<br><br>Operator actions required would be implemented via EOPs. |

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| Equipment should be installed on pedestals, or curbs should be provided as required to contain water and direct it to floor drains. (See NFPA 92M, "Waterproofing and Draining of Floors.")<br><br>Drains in areas containing combustible liquids should have provisions for preventing the spread of the fire throughout the drain system. | In areas which may contain radioactive contamination, water is collected, monitored, and if necessary, treated before release (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-24). | | Curbs are provided in the Intake Structure to prevent water or flammable liquid from flowing into the basement where both divisions of safety-related cables are routed (RG001680, NRC FP SER, 2/14/79, Section 4.5). | No further action required. Curb was verified to be installed in the FPE. |
| Water drainage from areas which may contain radioactivity should be sampled and analyzed before discharge to the environment.<br><br>In operating plants or plants under construction, if accumulation of water from the operation of new fire suppression systems does not create unacceptable consequences, drains need not be installed. | It is not practical to provide additional floor drain capacity where new systems are planned (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-24). | There are no combustible liquid tanks that are curbed in safety related areas. The drainage system is utilized to contain spills caused by leakage, overflows, or pipe rupture (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 16).<br><br>Where drains from safety-related areas tie into drains from other areas which contain a large quantity of flammable liquid and which could affect the safety related area, backflow protection will be provided to prevent the spread of a possible liquid fire via the drain system. This backflow protection may take the form of a check valve or a backflow preventer installed at the drain itself. (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Item P14) | RG&E will review the plant's drain system and provide backflow protection, to prevent the spread of a possible liquid fire via the drain systems, where drains from safety related areas tie into drains from other areas which contain large quantities of flammable liquid and which could affect the safety related area (RG001680, NRC FP SER, 2/14/79, Sections 3.2.6 and 4.5). | Backflow prevention was installed via EWR 2720. |
| | | Drainage in the Containment, Auxiliary Building Basement, Intermediate Building Basement, and the B Diesel Generator Room will be modified to ensure that combustible or flammable liquids will not be allowed to flow via the drain systems to a separate safety related areas (RG002065, RG&E/NRC, 9/28/79; RG002621, RG&E/NRC 6/4/80, Enclosure 2). | RG&E will use either check valves, or install piping, pumps and valves in separate drain sumps for areas containing significant quantities of fuel oil. The separate drain sumps and pumps will, on an individual basis, collect and handle the combustible liquids safely away from safety related areas (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 5). | |
| | | A barrier will be provided around the turbine oil storage area to contain possible oil spillage. The capacity of the enclosed area will be adequate to retain the entire contents of the tank with a 10% margin for fire water. (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Item P13) | D2a-3: A barrier will be provided around the turbine oil reservoir area to contain possible oil spillage. The capacity of the enclosure area will be adequate to retain the entire contents of the tank plus a 10% margin for fire water. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.17 and 5.11.6). | EWR 2928 installed required features. |

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| D.1.j Fire Barriers, Doors, Dampers and Penetrations<br><br>Floors, walls and ceilings enclosing separate fire areas should have minimum fire rating of three hours. Penetrations in these fire barriers including conduits and piping should be sealed, or closed, to provide a fire resistance rating at least equal to that of the fire barrier itself.<br><br>Door openings should be protected with equivalent rated doors, frames and hardware that have been tested and approved by a nationally recognized laboratory. Such doors should be normally closed and locked or alarmed with alarm and annunciation in the control room. | The fire hazards analysis (Section 4.0 of the Fire Protection Evaluation dated March 1977) identifies the fire area barriers in the plant and requirements for maintaining their integrity. These barrier requirements were determined by the fire loading and area hazards. The following fire area barrier modifications were identified (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-25):<br><br>Note: This Appendix A Summary section identifies FP commitments applicable to fire barriers which separate Fire Areas. FP commitments applicable to fire barriers within specific fire areas are addressed in section D.1.a to this table. | | | Refer to Volume 1 of the FPPR for the current Fire Hazards Analysis. |
| Penetrations for ventilation systems should be protected by a standard "fire door or damper" where required. (Refer to NFPA 80, "Fire Doors and Windows.") The fire hazard in each area should be evaluated to determine barrier requirements. 1f barrier fire resistance cannot be made adequate, fire detection and suppression should be provided, such as: (i) water curtain in case of fire, (ii) flame retardant coatings, (iii) additional fire barriers. | The following commitments were identified in the FHA and relate to fire area barriers. These commitments have been organized based on fire area interfaces: | | | |
| | | | | |
| | Auxiliary Building Barriers to Adjacent Areas: | | | |
| | Automatic fire dampers will be installed over the opening for the spent fuel pool ventilation cleanup charcoal filters in the auxiliary building wall (p. 4.2-11). | | D1j-2, D1j-10: RG&E will install rated fire dampers in duct penetrations in the spent fuel pool ventilation clean-up charcoal filter ducts in the Auxiliary Building. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.9, 4.9.2, and 5.4.6). | Fire dampers 1-411-1 through 1-411-21 were installed under EWR 2463. Fire damper 1-<br>411-21 was upgraded under EWR 4882. |
| | The unrated doors at the entrance to the intermediate building from the auxiliary building elevation 278'-4" will be replaced with A-label, 3-hour rated doors (p. 4.2-11, 4.3-9), | | D1j-6: RG&E will replace existing door with 3 hour door in the auxiliary building to intermediate building at the 278' elevation. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, 4.9.1, 5.4.6, 5.5.6, and 5.8.6). | Door F503 was replaced under EWR 1837. This is now a 3 hr door per the Fire Door Manual. |

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| | | D1j-4: Modify the construction joints around the Reactor Containment, with the surrounding buildings, to provide fire resistance commensurate with the hazard in the area (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P12; RG010682, RG&E/NRC, 9/1/78; RG001798, RG&E/NRC, 4/30/79). | Construction joints of the containment with the surrounding building will be modified to provide a fire resistance commensurate with the hazard in the area (RG001680, NRC FP SER, 2/14/79, Sections 3.1.25 and 4.11)<br><br>Based on the test results, RG&E's proposal to upgrade the construction joint seals with silicone material as the filler is acceptable (RG002940, NRC FP SER Supplement 1, 12/17/80 pg. 3 and 4) | Addressed this issue via DA-ME-94-118-09 and DA-ME-94-118-18. |
| | The wall between the auxiliary building and the nitrogen storage building will be upgraded to provide a 2-hour fire rated barrier which extends 4 feet beyond the nitrogen storage building (p. 4.14-1). | Additional time is required to respond to staff position P78 regarding fire protection of H2 lines in safety related areas. (RG001562, RGE/NRC, dated 10/31/78) | D1j-8: Walls between the Auxiliary Building and the Nitrogen Storage Building will be upgraded to provide a two hour rated fire barrier. In addition, the hydrogen piping supplying the VCT will be modified to provide protection from hydrogen leakage. (RG001680, NRC FP SER, 2/14/79, Section 3.1.8, 3.1.48). | A new storage building was built south of the SAF building under EWR 2421. |
| | | Ginna responded to the NRC FP SER and stated that an alternative is being considered to address SER items 3.1.8 and 3.1.48 for providing fire protection for H2 piping. The alternative involves moving H2 storage to a separate location. (RG001721, RGE/NRC, dated 3/13/79, Item 3).<br><br>D1j-8 (D2b-2): A new Hydrogen Storage Building will be constructed remote from the auxiliary building. This will eliminate the need to upgrade the walls between the auxiliary building and the nitrogen storage building. (RG002591, RGE/NRC, dated 5/23/80; RG002065, RG&E/NRC, 9/28/79, Item 3.1.48)<br><br>Information demonstrating that H2 piping in the auxiliary building is adequately protected was submitted in response to SER item 3.1.48 (RG002621, RGE/NRC, dated 6/4/80, Item 3.1.48). | Based on our review, we conclude that the hydrogen piping does not offer hazards that jeopardize safe shutdown equipment and/or circuits and, therefore, is acceptable. (RG002940, NRC FP SER Supplement 1, 12/17/80 pg. 4) | |
| | | | | |
| | <u>Intermediate Building Barriers to Adjacent Areas (not previously identified)</u> | | | |
| | | | | |

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| | The door between intermediate building elevation 253'-6" and the hot shop will be replaced with an A-labeled, 3-hour rated door (p. 4.3-3, 4.9-2), | | D1j-6: Door openings to neighboring areas will be protected by 3-hour rated fire doors. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, 4.9.1, 5.4.6, 5.5.6.). | Door F509 was replaced under EWR 1837. This is now a 3 hr door per the Fire Door Manual. |
| | The unlabeled door and gate between the intermediate building elevation 253'-6" and the turbine building will be protected with A-labeled, 3-hour rated doors (p. 4.3-7, 4.8-4), | | D1j-6: Door openings to neighboring areas will be protected by 3-hour rated fire doors. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, 4.9.1, 5.4.6, 5.5.6). | Doors F36 and S37F were replaced under EWR 1837. Door 36 was replaced under EWR 4932 and a 3 hour rated rolling door was installed. These are 3 hr doors per the Fire Door Manual. |
| | The opening from the intermediate building to the cable tunnel will be sealed to prevent heat and smoke from entering the cable tunnel (p. 4.3-7, 4.7-2 ), | | A barrier will be provided for the opening between the Intermediate Building and the Cable Tunnel. The adequacy of fire resistance of this barrier and penetrations in barriers separating the tunnel from the Auxiliary Building and the Control Building will be demonstrated. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.8 and 5.6.6). | A smoke barrier constructed similar to 1 hr rated construction with a 1 1/2 hr door was installed at the Intermediate Building entrance under EWR 2940. |
| | | The FP SER calls for the intermediate building to cable tunnel opening to be sealed. In fact, a barrier will be provided with a rated door. (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 29) | | |
| | The two unprotected openings (doors) between the intermediate building elevation 271'-0" and the service building will be protected by A-labeled, 3-hour rated doors (p. 4.3-8, 4.9-2), | | D1j-6: areas will be protected by 3-hour rated fire doors. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, 4.9.1, 5.4.6, 5.5.6). | Doors S46F and S65F were replaced under EWR 1837. These are 3 hr rated doors per the Fire Door Manual. |
| | The unlabeled door between the intermediate building elevation 278'-4" and the turbine building will be replaced with an A-labeled, 3 hour rated door (4.3-9, 4.8-4), | | D1j-6: areas will be protected by 3-hour rated fire doors. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, 4.9.1, 5.4.6, 5.5.6). | Door S44F was replaced under EWR 1837. This is now a 3 hr rated door per the Fire Door Manual. |
| | | Piping and duct penetrations of fire barriers should be upgraded to a fire resistance rating commensurate with the hazard on both sides of the barrier. (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P11, RG010682, RG&E/NRC, 9/1/78; RG001798, RG&E/NRC, 4/30/79). | Rated fire dampers will be installed in the duct penetration between the Intermediate Building and the Service Building near column line M on elevation 253'-6". (RG001680, NRC FP SER, 2/14/79, Sections 4.9.2). | Fire dampers I-318-1 through I-318-4, I-317, I-27, I-340-1, and I-340-2 were installed under EWR 2463. |

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| | | D1j-4: Modify the construction joints around the Reactor Containment, with the surrounding buildings, to provide fire resistance commensurate with the hazard in the area (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P12; RG010682, RG&E/NRC, 9/1/78; RG001798, RG&E/NRC, 4/30/79). | Construction joints of the containment with the surrounding building will be modified to provide a fire resistance commensurate with the hazard in the area (RG001680, NRC FP SER, 2/14/79, Sections 3.1.25 and 4.11)<br><br>Based on the test results, RG&E's proposal to upgrade the construction joint seals with silicone material as the filler is acceptable (RG002940, NRC FP SER Supplement 1, 12/17/80 pg. 3 and 4) | Addressed this with completion of DA-ME-94-118-09 and DA-ME-94-118-18. |
| | | See comments | RG&E will establish the adequacy of fire resistance for those walls separating the north and south sections of the Intermediate Building or upgrade them (RG001680, NRC FP SER, 2/14/79, Sections 3.1.38 and 4.11). | Ginna clarified this NRC FP SER statement and identified that the wall separating the north and south sections of the intermediate building is not considered to be a fire barrier. (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 7). |
| | <u>Control Complex Barriers to Adjacent Areas</u> | | | |
| | The non-rated double doors between the mechanical equipment room and the turbine building will be replaced with A-labeled, 3-hour rated doors (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-4, 4.8-4), | | D1j-6: The non-rated double doors between the mechanical equipment room and the turbine building will be replaced with A-labeled, 3-hour rated doors. (RG001680, NRC FP SER, 2/14/79, Section 5.8.6). | Door F24 was replaced under EWR 1837. This is now a 3 hr door per the Fire Door Manual. |
| | The doors in the fire barriers between the relay room and the computer room, stair tower, and the turbine building will be replaced with B-labeled, 1 1/2 hour rated doors including the B-labeled door between the turbine building and the relay room which has been negated by the card key lock system (p. 4.4-9), | | D1j-7: All doors in the barriers enclosing the area will be replaced with 1 1/2 hour fire doors. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, and 5.9.6). | Doors F502, F504 and F507 were replaced under EWR 1837. These doors were replaced with 3 hour fire rated doors. Fire door F507 was removed under PCR 96-125. |
| | Either a 2 hour fire barrier or an adequate water curtain will be installed between the turbine building and the control room (p. 4.4-13, 4.8-4). | D1a-4, F2-1: A bullet proof, pressure resistant, steel barrier, between the Turbine Building and the Control Building will be installed. An automatically operated water curtain will be provided instead of a rated fire barrier at the operating floor (289' 6" elv.) level. (RG009331, RG&E/NRC, 2/6/78; RG001509, RG&E/NRC, 8/25/78; RG002065, RG&E/NRC, 9/28/79). | A double-feed water curtain system will be installed over the steel diaphragm, currently under construction, which separates the control room from the operating floor of the turbine building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 3.1.21, 4.11, 5.10.6, and 5.11.6).<br><br>The water curtain protection proposed by RG&E will adequately protect the wall between the control room and the turbine building (RG002940, NRC FP SER Supplement 1, 12/17/80 pg. 2, 3). | The automatic water curtain actuated by heat detection (System S29) was installed under EWRs 1832B and 1833.<br><br>The pressure wall was installed under EWR 1836. |

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| | The 2 hour rating on the separations between the turbine building and the control complex mechanical equipment room, battery rooms, and the cable spreading/relay room in the control building is adequate based upon the fire loading in these areas and the protection provided for the turbine building hazards. (p 4.8-4) | | Barriers which do not have 3 hr ratings include: the 2 hr rated barriers separating the Control Complex from the Turbine Bldg at the lower elevations. Fire barriers in the plant will be adequate to contain fires and are therefore acceptable. (RG001680, NRC FP SER, 2/14/79, Sections 4.11). | |
| | | | | |
| | Diesel Generator Room Barriers to Adjacent Areas | | | |
| | The wall between the Diesel Generator Rooms is 12" concrete block. All other walls enclosing the rooms are 12" reinforced concrete. The fire areas are separated by a 12" reinforced concrete wall with sealed pipe penetrations. This exceeds the requirements of a 3-hr rated barrier. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p 4.5-1) | A bullet proof, pressure resistant, steel barrier, between the Turbine Building and the Diesel Generator Rooms will be installed. This wall provides for over pressure protection in the event of a high energy line break and for protection from postulated fires. (RG009331, RG&E/NRC, 2/6/78; RG001509, RG&E/NRC, 8/25/78;). | Fire barriers in the plant will be adequate to contain fires and are therefore acceptable. (RG001680, NRC FP SER, 2/14/79, Sections 4.11).<br><br>The two Diesel Rooms are separated by a 3 hr rated fire barrier. (RG001680, NRC FP SER, 2/14/79, Sections 5.3.3). | Pressure resisting wall installed under EWR 1836. |
| | The 1 1/2 hr rated fire doors in the wall separating the this zone from the Turbine Building provide adequate separation based on dikes and drains to contain diesel oil spills and water from the deluge system. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p 4.5-1) | | Each Diesel Generator Room is protected from fire by a wall capable of 3 hr fire resistance with B labeled fire doors. (RG001680, NRC FP SER, 2/14/79, Sections 5.3.4). | |
| | | | | |
| | The door closers on the doors from the turbine building to the diesel generator rooms will be adjusted to ensure closure against the pressure differential created by the turbine building ventilation system (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-3), | | The door closers on the fire doors between each Diesel Generator Room and the Turbine Building will be adjusted to ensure that the door close against the pressure differential created by the ventilation system in the Turbine Building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.16 and 5.3.6). | These are doors F29 and F30. This same problem was covered under EWR 5108 for other doors not including F29 and F30. These doors are monitored under procedure FPS-15 and are considered acceptable. Suitable closures are provided to ensure operability. |
| | | | | |
| | Turbine Building to Adjacent Areas (not previously identified) | | | |
| | The turbine oil storage area is separated from the turbine building by a 12 inch concrete block wall having a A fire resistance rating in excess of 3 hrs. The door opening to the turbine building is protected with a B labeled 1 1/2 hr door. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p 4.11-1) | | | |

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| | A-labeled doors to the turbine building will prevent fire exposure to the condensate demineralizer building (AVT). (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p 4.13-2) | | | |
| | | | D1j-7: Unlabeled doors in walls between the Turbine Building and adjoining buildings will be replaced with Class B labeled fire doors (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5 and 5.11.6). | Doors F5, F6, F7, F14, F15, F19, F24-F31, F36, F504, S37F and S44F are all 3 hr doors per the Fire Door Manual. Door S51F to the control room is not rated per the Fire Door Manual which was verified by walkdown information but was determined to be acceptable due to security provisions. |
| | | | | |
| | Reactor Containment Barrier to Adjacent Areas | | | |
| | Reactor containment is considered a separate fire area and is completely separated from all other structures and areas by its walls and dome. It is constructed of reinforced concrete and an inside steel liner. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.1) | | | The containment barrier is maintained for accident mitigation purposes. DA -ME-93-117A addresses fire protection program requirements applicable to the barrier. |
| | | | | |
| | Generic Fire Door Information | | | |
| | | D1j-7a, D1j-7b: The three Control Building/ Turbine Building doors at the basement level and the two Diesel Generator Room doors will serve only a pressure resisting function (RG010689, RG&E/NRC, 10/18/78). | | Doors F24, F25, F26, F29 and F30 are 3 hr doors per the Fire Door Manual which was verified by walkdown information. |
| | | | | |

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| | | D1j-5: All fire doors will be electrically supervised to alarm and annunciate at a constantly manned location or they will be locked closed (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P18; RG&E/NRC, 9/1/78).<br>Note: Commitment revised, see below<br><br>D1j-5 (D1j-15): All fire doors will be electrically supervised with time delayed alarm and annunciation in a constantly occupied area, or kept closed and inspected daily to verify that they are in the closed position. Because the relay room is protected by an automatic total flooding gas suppression system, the doors will be electrically supervised. (RG003327, RG&E/NRC, 6/3/81) | All fire doors will be electrically supervised with time delayed alarm and annunciation in a constantly occupied area, or they will be locked closed (RG001680, NRC FP SER, 2/14/79, Sections 3.1.30 and 4.9.1).<br>Note: Commitment revised, see below<br><br>All fire doors will be electrically supervised to alarm and annunciate at a constantly manned location or they will be kept closed and inspected daily. Relay room doors will be electronically supervised. (RG003357, NRC FP SER Supplement 3, 6/22/81) | CATS 10042 addressed how the intent of this commitment has been met. |
| | | | | |
| | <u>Generic Fire Dampers Information</u> | | | |
| | | Fire dampers are located in selected supply and return ductwork where they penetrate fire barriers. Fire dampers of 1 1/2 hour rating are actuated by fusible links. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 25). | Fire dampers are installed in selected ventilation duct penetrations of fire barriers in various parts of the plant. The licensee has indicated that all fire dampers installed, or to be installed, in the ventillation ducts have or will have, a rating of 1 1/2 hours or 3 hours where fire severity on either side of the penetration is greater than 1 1/2 hours. (RG001680, NRC FP SER, 2/14/79, Section 4.9.2) | |
| | | | | |
| | <u>Generic Penetration Seal Information</u> | | | |
| | | D1j-1: Temporary seals in pipe and vent duct penetrations through fire barriers, made of ceramic fiber insulating material, will be replaced with permanent seals (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 15). | Ceramic fiber insulating material fill has been used as a temporary seal in some places and is being replaced by one of three permanent methods (RG001680, NRC FP SER, 2/14/79, Section 4.9.4). | EWR 4941 addressed this and procedure FPS-1 controls required breaches. |
| | | D1j-3: Piping and duct penetrations of fire barriers will be upgraded to a fire resistance rating commensurate with the hazard on both sides of the barrier. ASTM E-119 fire test reports for comparable penetrations will be on file to verify seal adequacy. (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P11; RG010682, RG&E/NRC, 9/1/78; RG001798, RG&E/NRC, 4/30/79) | Piping and duct penetrations of fire barriers will be upgraded to a fire resistance rating commensurate with the hazards on both sides of the barrier (RG001680, NRC FP SER, 2/14/79, Sections 3.1.24, 4.9.2, 4.9.4, 5.4.6, and 5.5.6). | Completed under EWR 1850, however, additional study was performed under EWR 4941. Acceptability of plant fire seals was documented in this program development and use of the fire barrier penetration seals program database. |

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| | | | Existing piping penetration seals will be demonstrated to have adequate fire resistance or will be upgraded (RG001680, NRC FP SER, 2/14/79, Sections 3.2.5 and 4.9.4).<br><br>- Based on the data in the test reports provided by RG&E, the NRC concludes that the penetration seal designs have been properly verified and are acceptable with regard to fire protection (RG002940, NRC FP SER Supplement 1, 12/17/80, p. 3). | No further action required, however, additional study was performed under EWR 4941. Acceptability of plant fire seals was documented in this program development under EWR 4941 and use of the fire barrier penetration seals program database. |
| | Generic Structural Steel Information: | | | |
| | Unprotected structural steel is located in the following plant areas: Aux Building, Screen House, Turbine Bldg., Control Complex, and Turbine Oil Storage Area, (RG010540, RG&E Fire Protection Evaluation, 2/24/77, Sections 4.2, 4.4, 4.6, 4.8,.and 4.11) | Several buildings at the station are steel structures. These are: Intermediate Bldg., Control Complex, Turbine Bldg., Diesel Bldg., Turbine Oil Storage Area, and operating floor of the Aux Building,.<br><br>An oil fire is considered to be the only type of fire that would result in steel failure. Therefore, only the steel structures located in oil hazard areas were evaluated.<br><br>In summary: structural collapse of an individual diesel room roof structure is not assumed and if failure were to occur, safe shutdown would not be impacted because the roof is independent from other adjacent structures; an automatic deluge system is provided in the Turbine Oil Storage Room and will protect the steel; localized steel failure may occur in the Intermediate Bldg however, remaining steel supports would prevent damage to safety related systems; safe shutdown would not be impacted in the event of turbine oil fires in specific Turbine Bldg locations. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Items 12 and 58). | See below | See below |
| | | RG&E is still evaluating NRC staff position 8 which states that exposed steels should be protected where both divisions of safety related systems could be jeopardized. This includes, but is not limited to, the Control Bldg, Screen House, and Turbine Bldg. (RG009792, RGE/NRC, dated 9/22/78, Item P8) | RG&E will conduct a study to determine what active and passive systems should be installed to control fires in high fire load areas to prevent structural failures that could jeopardize safe shutdown of the plant. This study will interface with the safe shutdown study and will be complete in December 1979 (RG001680, NRC FP SER, 2/14/79, Section 3.2.8). | Summary submitted to NRC on 6/30/80 (RG002659, RGE/NRC, 6/30/80). See items below. |

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| | | Protection of exposed structural steel is proposed in all areas where: 1) a high fire load exists and no suppression is provided; and 2) where rate of combustion of combustibles could lead to failure of steel before suppressions systems have become effective. Cable insulation fires and charcoal filter fires will not impact structural steel due to detection, suppression or manual suppression capability. (RG002659, RG&E/NRC, 6/30/80). | RG&E response to exposed structural steel is acceptable in part only. Because of those areas identified as not being in compliance with Appendix R, this will be considered an open item and will be required to meet Appendix R requirements. (RG003007, NRC FP SER Supplement 2, 2/6/81) | Plant areas not approved were required to be addressed under Appendix R. (RG003034, NRC/RG&E, 2/13/81, p. 2). |
| | | Areas evaluated include:<br>1) The Diesel Rooms will be protected by an automatic suppression system and potential roof collapse will not impact safe shutdown. | The collapse of a diesel generator room ceiling would not impair safe shutdown since the redundant diesel would not be affected. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3). | Systems S12 and S13 were converted to automatic operation actuated by heat detection under EWRs 1833 and 1832B. PCR 2001-0021 upgraded both systems |
| | | 2) A fire near the Turbine/Intermediate Bldg wall would be extinguished by manual suppression capability, no oil hazards are located in the area. The turbine oil reservoir is 40' from the TB/IB wall. A diked area will contain oil spills and fixed detection and a remote manual water spray system will limit damage in the area. However, localized steel failure may occur and coating protection of structural steel will be provided. | The licensee proposed to protect the structural steel in the area of the Turbine Oil Reservoir. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3) | Structural steel protection near the turbine oil reservoir was provided under EWR 2928. |
| | | 3) A fire near the Turbine Bldg/Control Complex would be extinguished by manual hose streams, no oil hazards are located in the area. The control room pressure resisting wall will be provided with an automatic water curtain spray system. The H2 Seal Oil Unit is 40" from the Control Complex wall. A trench collects oil leakage and a manual deluge water spray system is provided. | RG&E should protect the structural steel in the areas of the hydrogen seal oil unit. This is considered an open item. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3). | Water curtain and detection provided under EWRs 1832B and 1833. The current safe shutdown analysis for App. R demonstrates shutdown from outside the area. Steel is not protected. It should be noted that a one hour rated enclosure was installed around the entire seal oil unit. |
| | | 4) The turbine island and the condenser pit contain oil hazards. Oil lines to the bearings are run in guarded pipe and protected by the turbine island automatic sprinkler system. The basement floor is sloped to the condenser pit where a manual water spray system and an alarm system is provided. | RG&E should protect the structural steel in the areas of the turbine island and condenser pit. This is considered an open item. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3). | The current safe shutdown analysis for App. R demonstrates shutdown from outside the area. Steel is not protected. |
| | | 5) The northern zone of the Intermediate Bldg contains the aux feedwater turbine and associated oil tank. Curbs to contain oil, detection, and a manual suppression system are provided in the area. Localized steel support failure will not jeopardize safety related equipment. | | FP SER supplement 2 did not identify the Int. Bldg area as an open item. Submittal info accepted. |

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| | | 6) The Turbine Oil Storage Room is protected by automatic suppression which is considered adequate to protect steel in the roof. | The roof structure is independent of other structures. Safe shutdown will not be impacted. Additional fire protection is not required. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3) | |
| | | 7) The Screen House contains the diesel fire pump oil tank. A curb has been provided to contain oil and an automatic wet pipe sprinkler system is being installed to protect the service water pumps and fire pumps. Smoke detection is provided in the area. | RG&E's protection for the exposed structural steel in the Screen House does not meet Section III.G.2(a) of Appendix R to 10 CFR 50 (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3 and 4). | The current safe shutdown analysis for App. R demonstrates shutdown from outside the area. Steel is not protected. |
| | | 8) In Containment, the RCPs represent a lube oil hazard. The proposed lube oil collection system will contain potential lube oil spills. In addition, separate heat detection will be provided for each pump. | The RCP lube oil collection system should provide adequate detection for exposed structural steel. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3) | RCP oil collection was installed via EWR 2462. Heat detection was installed via EWR 1832B. |
| | | 9) Failure of the Control Complex steel are prevented by the addition of automatic and manual fixed fire suppression systems and smoke detection systems being installed. The Computer Room/ Relay Room halon system is being converted for auto operation and a manual water fixed water spray system is also being provided. | We agree with the assumption that fires involving cable insulation, charcoal filters, or ordinary combustibles should be slow developing and not threaten structural integrity of steel. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 2) | Control complex upgrades were installed. |
| | | | | |
| D.2 <u>Control of Combustibles</u><br><br>D.2.a <u>Near Safety-related Systems</u><br><br>Safety related systems should be isolated or separated from combustible materials. When this is not possible because of the nature of the safety system or the combustible material, special protection should be provided to prevent a fire from defeating the safety system function. | The fire hazards analysis (Section 4.0 to the FPE) identifies these hazards and the protection to control them. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-26)<br><br>The FHA identified that transient combustibles would be controlled in the following areas: | | RG&E will remove from safety-related plant areas all transient combustibles which are not normally used for routine operational or maintenance activities on a regular basis (RG001680, NRC FP SER, 2/14/79, Sections 3.1.47 and 5.4.6). | Procedure No. FPS-16 governs the storage of both permanent and transient combustibles. |

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| Such protection may involve a combination of automatic fire suppression, and construction capable of withstanding and containing a fire that consumes all combustibles present. Examples of such combustible materials that may not be separable from the remainder of its system are:<br>1. Emergency diesel generator fuel oil day tanks<br>2. Turbine-generator oil and hydraulic control fluid systems.<br>3. Reactor coolant pump lube oil system | Storage of paper and flammable goods will be minimized on the auxiliary building elevation 271'/278'-4". Necessary amounts of such materials will be stored in metal cabinets located away from any safe shutdown equipment. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.2-11) | | | |
| | Storage in the intermediate building sub-basement will be administratively controlled (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.3-2). | | | Procedure No. FPS-16 governs the storage of both permanent and transient combustibles in this area. |
| | The cable spreading/relay room will not be used for the storage of operational records and supplies (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-9). | | | Procedure No. FPS-16 governs the storage of both permanent and transient combustibles in this area. |
| | | A fire or explosion involving hazardous materials located in laboratories or storage areas will not affect safe shutdown of the plant (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 19). | | No further action required. |
| | | B3c-6: A UL approved paint locker is located in the Auxiliary Building (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 48). | | Lockers were relocated to CSB, Auxiliary Building does not contain UL listed lockers as no material of this type is stored in the Auxiliary Bldg. |

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| D.2.b. Flammable and High Pressure Gas Storage<br><br>Bulk gas storage (either compressed or cryogenic), should not be permitted inside structures housing safety-related equipment. Storage of flammable gas such as hydrogen, should be located outdoors or in a separate detached buildings so that a fire or explosion will not adversely affect any safety-related systems or equipment. (Refer to NFPA 50A, "Gaseous Hydrogen Systems.") | Only a small number of compressed gas cylinders such as H2, Ar, $CO_2$, N2, etc., are used inside the buildings containing safety related equipment. These gases are used for instruments (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-26).<br><br>Bulk gas storage is in the hydrogen storage area and in the nitrogen storage building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 4.12-1, 4.14-1, 5-26). | D2b-1: Piping will be relocated and will not pass though a safety related equipment area (RG002065, RG&E/NRC, 9/28/79; RG002621, RG&E/NRC, 6/4/80, p. 10). | The hydrogen piping supplying the volume control tank will be modified to provide protection against hazards from hydrogen leakage or the hydrogen piping will be relocated (RG001680, NRC FP SER, 2/14/79, Sections 3.1.48 and 5.4.6)<br><br>- An alternative is being considered to remove the hydrogen storage from the nitrogen storage building to a separate location and relocating piping (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 3).<br><br>- Based on NRC review, it is concluded that the relocated hydrogen piping does not offer hazards that jeopardize safe shutdown equipment and/or circuits and is acceptable (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 4) | Hydrogen piping was relocated under EWR 2421. |
| Care should be taken to locate high pressure gas storage containers with the long axis parallel to building walls. This will minimize the possibility of wall penetration in the event of a container failure. Use of compressed gases (especially flammable and fuel gases) inside buildings should be controlled. (Refer to NFPA 6, "Industrial Fire Loss Prevention.") | | | | Procedure No. FPS-16 administratively controls the storage of flammable and oxidizing gases. |
| D.2.c. Use of Plastic Materials<br><br>The use of plastic materials should be minimized. In particular, halogenated plastics such as polyvinyl chloride (PVC) and neoprene should be used only when substitute non-combustible materials are not available. All plastic materials, including flame and fire retardant materials, will burn with an intensity and BTU production in a range similar to that of ordinary hydrocarbons. When burning, they produce heavy smoke that obscures visibility and can plug air filters, especially charcoal and HEPA. The halogenated plastics also release free chlorine and hydrogen chloride when burning which are toxic to humans and corrosive to equipment. | It is impractical to meet this criteria because of the large volume of PVC cable insulation used throughout the plant. Future modifications will take this into consideration. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-27) | D3g-1: After a review, RG&E believes that none of the insulation produces combustion products of an unusual or significantly hazardous nature (RG001798, RG&E/NRC, 4/30/79). | RG&E is investigating the fire characteristics, including the fire resistance of the cable insulation used in the plant (RG001680, NRC FP SER, 2/14/79, Section 3.2.4).<br><br>- RG&E provided a list of cable insulation types and quantities used in the plant. The assumptions on page I-1 of RG&E's study performed in response to SER Section 3.2.1 obviate the need for a separate staff analysis of cable insulation. NRC concludes that this item is acceptable. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 2) | No further action required. |

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| D.2.d <u>Storage of Flammable Liquids</u><br><br>Storage of flammable liquids should, as a minimum, comply with the requirements of NFPA 30, "Flammable and Combustible Liquids Code." | Flammable liquids are used sparingly with storage and use meeting NFPA 30 and OSHA 1910.106 requirements (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-27). | | | Procedure No. FPS-16 governs the storage of flammable liquids. However, NFPA 30 and OSHA 1910.106 are not specifically referenced. CATS 10043 addresses NFPA 30 considerations. |
| D.3 <u>Electric Cable Construction, Cable Trays and Cable Penetrations</u> | | | | |
| D.3.a Only non-combustible materials should be used for cable tray construction. | Cable trays are noncombustible metal ladder, bottom type trays (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-27). | | | No further action required. |
| D.3.b <u>Cable Spreading Room Fire Protection</u><br><br>See section E.3 for fire protection guidelines for cable spreading rooms. | | | | |
| D.3.c <u>Fire Protection for Cable Trays Outside Cable Spreading Room</u><br><br>Automatic water sprinkler systems should be provided for cable trays outside the cable spreading room. Cables should be designed to allow wetting down with deluge water without electrical faulting. Manual hose stations and portable hand extinguishers should be provided as backup. Safety-related equipment in the vicinity of such cable trays, that does not itself require water fire protection, but is subject to unacceptable damage from sprinkler water discharge, should be protected from sprinkler system operation or malfunction. When safety-related cables do not satisfy the provisions of Regulatory Guide 1.75, all exposed cables should be covered with an approved fire retardant coating and a fixed automatic water fire suppression system should be provided. | Consistent with the goal of safe shutdown, areas with interaction of redundant trains will be protected with automatic water spray or equivalent protection. General protection for all cables is a property conservation consideration, and not a safe shutdown consideration. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-28)<br><br>Note: See section D.1.a for specific commitments relative to installing automatic water sprinkler systems in plant areas with cable trays containing redundant safety train cables. | Certain wiring is connected to safety-related equipment, but is classified and routed as non-safety related with essentially no constraints. The possible consequences of a fire in such wiring are being investigated. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 20) | RG&E is continuing an analysis to determine whether safe shutdown can be achieved without equipment and cables in each plant area where fire is postulated (RG001680, NRC FP SER, 2/14/79, Sections 3.2.1 and 4.1).<br><br>- RG&E is performing a detailed analysis of all safety-related circuits to evaluate the impact of fires on safe plant shutdown (RG001680, NRC FP SER, 2/14/79, Sections 3.2.2 and 4.10).<br><br>- Item 3.2.2 should be consolidated under item 3.2.1, therefore, item 3.2.2 will no longer be carried as an open item. This item will be required to comply with Appendix R to 10 CFR 50. (RG002940, NRC FP SER Supplement 1, 12/17/80, pp. 5, 6) | See the Appendix R Commitment Summary Table in Appendix B of this report. |

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| D.3.d Cable and Cable Tray Penetration Seals<br><br>Cable and cable tray penetration of fire barriers (vertical and horizontal) should be sealed to give protection at least equivalent to the fire barrier. The design of fire barriers for horizontal and vertical cable trays should, as a minimum, meet the requirements of ASTM E-119, "Fire Test of Building Construction and Materials," including the hose stream test. Where installed penetration seals are deficient with respect to fire resistance, these seals may be protected by covering both sides with an approved fire retardant material. The adequacy of using such material should be demonstrated by suitable testing. | Cable penetrations in fire barriers have been or will be sealed with silicon foam consistent with fire barrier fire resistance requirements (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-28). | RG&E is reviewing the adequacy of the FM test. With the exception of the hose stream test phase, RG&E believes the test to be applicable to seals of the same size or smaller than the seals tested. Seals that are significantly different are being reviewed on a case by case basis (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item P1).<br><br>- RG&E believes that the test results apply except for the floor penetration seal located in the northwest corner of the Relay Room. It is proposed that the opening be subdivided and sealed with two or more independent qualified fire seals (RG002621, RG&E/NRC, 6/4/80). | D3d-1: RG&E will review the applicability of the FM test results to the cable penetration seals at Ginna (RG001680, NRC FP SER, 2/14/79, Sections 3.2.5 and 4.9.3).<br><br>- RG&E has verified, and the NRC agrees, that the seal designs at Ginna are either similar to or more conservative than the seal designs tested by the ASTM E-119 fire test method for a three hour rating (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 5). | Completed under EWR 1850. However additional study was performed under EWR 4941. EWR 4941 addressed this issue. |
| D.3.e Cable Tray Fire Breaks<br><br>Fire breaks should be provided as deemed necessary by the fire hazards analysis. Flame or flame retardant coatings may be used as a fire break for grouped electrical cables to limit spread of fire in cable ventings. (Possible cable derating owing to use of such coating materials must be considered during design.) | Fire breaks, per se, are not deemed necessary (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-29). | No credit has been taken in the Fire Protection Evaluation Report dated March 1977 for any fire breaks and fire stops (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 21). | | No further action required. |
| D.3.f Cable Construction and Flame Tests<br><br>Electric cable constructions should, as a minimum, pass the current IEEE No. 383 flame test. (This does not imply that cables passing this test will not require additional fire protection.). For cable installation in operating plants and plants under construction that do not meet the IEEE No. 383 flame test requirements, all cables must be covered with an approved flame retardant coating and properly derated. | Adequate protection will be provided in accordance with the fire hazards analysis (Section 4.0 to the FPE). Installation of flame retardant coatings and derating of cable is not practical nor particularly beneficial to keep any fire from affecting both safety trains (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-29). | | The licensee is investigating the fire characteristics, including the fire resistance of the cable insulation used in the plant. (RG001680, NRC FP SER, 2/14/79, Sections 3.2.4). | |
| | | RG&E performed and submitted a report which addressed safe shutdown in all fire areas. This report assumes all equipment in the area fails. (RG002271, RGE/NRC, dated 12/28/79) | The assumptions on page I-1 of the licensees study performed in response to SER Section 3.2.1 obviate the need for a separate staff analysis of the fire characteristics of electrical cable insulation. We conclude that this item is acceptable. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 2) | No further action required. |
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| D.3.g <u>Cable Construction Corrosive Gas Characteristics</u><br><br>To the extent practical, cable construction that does not give off corrosive gases while burning should be used in new cable installations. | In view of the vast amount of PVC currently installed, this would be of little value (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-29). | | | No further action taken. |
| D.3.h <u>Cable Trenches, Tunnels and Culverts</u><br><br>Cable trays, raceways, conduit, trenches or culverts should be used only for cables. Miscellaneous storage should not be permitted, nor should piping for flammable or combustible liquids or gases be installed in these areas. Installed equipment in cable tunnels or culverts, need not be removed if they present no hazard to the cable runs as determined by the fire hazards analysis. | The cable tunnel and duct banks meet this criterion (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-29). | | | These areas are combustible control zones under Procedure No. FPS-I6. |
| D.3.i <u>Cable Tunnel and Cable Spreading Room Smoke Venting</u><br><br>The design of cable tunnels, culverts, and spreading rooms should provide for automatic or manual smoke venting as required to facilitate manual fire fighting capability. | Reliance is placed on the fixed water spray in the Cable Tunnel to minimize the need for difficult manual suppression. The Cable Spread/Relay Room is not provided any outside mechanical ventilation. A Halon 1301 system is installed to provide early flame knockdown. A smoke detection system will actuate the system prior to the generation of copious smoke. Manual hose lines can then be used by fire brigade members with appropriate breather apparatus. An outside door can be used for smoke removal. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-30). | | | No further action required. |
| D.3.j <u>Cable Routing in Control Room</u><br><br>Cables in the control room should be kept to the minimum necessary for operation of the control room. All cables entering the control room should terminate there. Cables should not be installed in floor trenches or culverts in the control room. Existing cabling installed in concealed floor and ceiling spaces should be protected with an automatic total flooding Halon system. | All cables in the Control Room come through the floor from the Relay Room and terminate in control consoles (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-30). | | | No further action required. |
| D.4 <u>Ventilation</u> | | | | |

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| D.4.a Smoke Removal<br><br>The products of combustion which need to be removed from a specific fire area should be evaluated to determine how they will be controlled. Smoke and corrosive gases should generally be automatically discharged directly outside to a safe location. | Ventilation for critical areas of the plant is evaluated in Section 4.0 of the Fire Protection Evaluation dated March 1977 (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-30). | The primary heat and smoke removal system will be portable smoke ejectors. Additional smoke ejection units will be provided by the local fire department. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 24). | A third 5000 CFM portable smoke ejector will be provided (RG001680, NRC FP SER, 2/14/79, Sections 3.1.27 and 4.4.1). | Procedure SC-3.15.15 identifies locations of required equipment. |
| | | High limit thermostats are provided on all Auxiliary Building, Control Access, Reactor Containment purge exhaust and supply, and control room air handling systems to stop the fans (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 25). | | No further action required. |
| | | D4a-1: The final Design Criteria for the Cable Tunnel Fire Protection Evaluation modification will include requirements for heat and smoke ventilation. Portable smoke ejectors are presently available for heat and smoke removal. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 57). | | No further action required. |
| Smoke and gases containing radioactive materials should be monitored in the fire area to determine if release to the environment is within the permissible limits of the plant Technical Specifications. The products of combustion which need to be removed from a specific fire area should be evaluated to determine how they will be controlled. | Areas containing radioactive material release potentials are outlined in Section 4.0 of the Fire Protection Evaluation dated March 1977 (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-30). | | Ventilation discharge in controlled areas is monitored for radioactive contamination. If high levels are detected, contaminated air is recirculated through filters and smoke exhaust operations, if in progress, will be terminated (RG001680, NRC FP SER, 2/14/79, Section 4.4.1). | No further action required. Refer to DA-ME-2000-063 and procedure SC-3.16.13. |
| D.4.b Ventilation Exhaust Radiation Evaluation<br><br>Any ventilation system designed to exhaust smoke or corrosive gases should be evaluated to ensure that inadvertent operation or single failures will not violate the controlled areas of the plant design. This requirement includes containment functions for protection of the public and maintaining habitability for operations personnel. | No systems are designed solely for smoke removal. Existing ventilation systems which could be used for smoke removal meet these criteria (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-31). | The present plant HVAC systems were not designed or rated for heat and smoke removal (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 24).<br><br>- The present plant HVAC system will not be utilized for heat and smoke removal (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 26). | Installed air handling systems are capable of exhausting limited volumes of smoke directly to the outside (RG001680, NRC FP SER, 2/14/79, Section 4.4.1). | No further action required. |
| D.4.c Ventilation System Power Supply and Controls<br><br>The power supply and controls for mechanical ventilation systems should be run outside the fire area served by the system.. | The power supply and controls for safe shutdown ventilation systems were considered in Section 4.0 of the Fire Protection Evaluation dated March 1977 and are protected (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-31). | | | No further action required. |

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| | | D4c-1: The fan/air conditioning unit for the Battery Room will be located in the Equipment Air Handling Room (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 52). | | EWR 1100 installed a temporary AC unit which was later made permanent. PCR 96-084 installed an upgraded system. |
| D.4.d <u>Fire Protection for Charcoal Filters</u><br><br>Fire suppression systems should be installed to protect charcoal filters in accordance with Regulatory Guide 1.52, "Design Testing and Maintenance Criteria for Atmospheric Cleanup Air Filtration." | Automatic water spray will be provided to protect charcoal filters as warranted by the fire hazards analysis. Water spray protection will be provided on the Aux Bldg charcoal filters located on the 253' elevation due to exposure of redundant cables (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.2-8, 5-31). | D1a-4, D4d-1: The factory installed water deluge system provided with the charcoal filter unit for the Auxiliary Building will be connected and will operate automatically (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 32; RG002065, RG&E/NRC, 9/28/79). | RG&E will connect the factory-installed spray system provided with the charcoal filter unit of the auxiliary building ventilating system to a water supply controlled by an automatic deluge valve actuated by the existing heat detectors in the filter units (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.5, 4.4.2) | EWR 1086 connected the 1G charcoal filter along with wiring changes for automatic operation. |
| | Detection will be installed in the filter exhaust ducts for the reactor containment purge charcoal filter units on the 315'-4" elevation of the intermediate building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.3-12). | | A fire detection system will be added to the intermediate building elevation 315'-0" purge filter exhaust ducts and the reactor containment purge charcoal filters (RG001680, NRC FP SER, 2/14/79, Section 3.1.1). | Systems Z23 and Z24 were installed under EWR 1832B. |
| | Because of the low probability of ignition of the charcoal filters, the lack of exposure hazards to these filters and the absence of of any hazard to safe shutdown equipment, no automatic suppression system is required for the spent fuel pool ventilation clean-up filter. Automatic fire dampers will be installed over the opening for the spent fuel pool ventilation cleanup charcoal filters in the auxiliary building wall (p. 4.2-11), | Fire dampers are located in selected supply and return ductwork where they penetrate fire barriers. Fire dampers of 1 1/2 hour rating are actuated by fusible links. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 25). | D1j-2, D1j-10: RG&E will install rated fire dampers in duct penetrations in the spent fuel pool ventilation clean-up charcoal filter ducts in the Aux Building. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.9, 4.9.2, and 5.4.6). | Fire dampers I-411-1 through I-411-21 were installed under EWR 2463. Fire damper I-411-21 was upgraded under EWR 4882. |
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| D.4.e <u>Fresh Air Intakes</u><br><br>The fresh air supply intakes to areas containing safety related equipment or systems should be located remote from the exhaust air outlets and smoke vents of other fire areas to minimize the possibility of contaminating the intake air with the products of combustion. | Pertinent air supply intakes are identified in the fire hazards analysis. The fire hazards analysis identifies provisions for various systems which prevent smoke from being drawn back into the plant or recycled (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-31). | Provisions made on various systems which prevent smoke from being drawn back into the plant or recycled are discussed in depth in the March 1977 Fire Protection Evaluation report (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 27). | | No further action required. Refer to procedure SC-3.16.13 |
| | The fresh air intake for the Auxiliary Building is located on the roof. This intake could be exposed to a small amount of smoke from an oil transformer fire. The existing dampers can be used to isolate the intake should it become necessary (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.2-2). | | | No further action required. |

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| | The ventilation system for the Intermediate Building currently draws supply air from the Turbine Bldg. RG&E plans to install vent air supply fans in the roof of the Intermediate Bldg. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.3-1). | | | Four roof exhaust fans were installed as verified by P&ID 33013-1872 and east wall openings were provided for outside air capability. The air intake openings are provided with manual dampers. |
| | Mechanical ventilation is provided for all areas of the Control Complex. The Control Room atmosphere is filtered, heated, and cooled by a separate vent system. This circulates air through a central a/c unit located in the basement. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-2). | | | |
| | Air Intake louvers are located on the south wall of the Turbine Building above the south wall of the Control Complex. This intake could be exposed due to smoke from a fire in one of the two oil filled transformers adjacent to the Control Complex. Existing pneumatic operated dampers can be positioned from the Control Room to isolate fresh air and prevent smoke infiltration. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-2). | | | |
| | The Battery Room is ventilated by wall mounted supply and exhaust fans. The air comes from the Mech. Equip Room and exhausts to the Turbine Bldg. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-2). | | | Exhaust air from the Battery rooms was relocated to the TSC roof. |
| | | | | |
| D.4.f Stairwells and Elevators<br><br>Stairwells should be designed to minimize smoke infiltration during a fire. Staircases should serve as escape routes and access routes for fire fighting. Fire exit routes should be clearly marked. Stairwells, elevators, and chutes should be enclosed in masonry towers with minimum fire rating of three hours and automatic fire doors at least equal to the enclosure construction, at each opening into the building. Elevators should not be used during fire emergencies. | Most stairways in the plant are open between floors. Likewise, numerous equipment penetrations in floors would allow smoke infiltration between floors. Doors, dampers and penetration seals in fire barriers limit the spread of smoke between fire areas (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-31). | D1j-7, D4f-1: The stairwell between the Relay Room and the Control Room is the only one that has barriers separating it from other areas. The two doors in the two hour wall at the relay room level will be replaced with "B" label doors. All other stairways are open. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 23). | The presently installed doors on the control complex stair tower will be replaced with 1 1/2 hour rated B labeled fire doors (RG001680, NRC FP SER, 2/14/79, Section 3.1.5). | Doors F502 and F508 were replaced under EWR 1837. These are now 3 hr doors per the Fire Door Manual which is based upon walkdown information. |
| | Fire exit routes will be clearly marked. Signs are posted at elevators stating there use in case of fire is prohibited (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-31). | | | No further action required. |

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| | | "QUICK" pry bars and fire axes are provided to breach a barrier to provide fire brigade access and personnel egress in the event of a locking mechanism failure (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 6). | | No further action required. |
| Where stairwells or elevators cannot be enclosed in three-hour fire rated barrier with equivalent fire doors, escape and access routes should be established by Prefire Plan and practiced in drills by operating and fire brigade personnel. | | B5-3: RG&E will establish documented pre-fire plans (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P25; RG010682, RG&E/NRC, 9/1/78). | Plans covering fire fighting strategies for safety related areas and areas presenting a hazard to safety related equipment will be developed and documented (RG001680, NRC FP SER, 2/14/79, Sections 3.1.34 and 6.5). | Pre-fire plans were developed under EWR 10116. |
| D.4.g <u>Smoke and Heat Vents</u><br><br>Smoke and heat vents may be useful in specific areas such as cable spreading rooms and diesel fuel oil storage areas and switchgear rooms. When natural-convection ventilation is used, a minimum ratio of one-square foot of venting area per 200 $ft^2$ of floor area should be provided. If forced-convection ventilation is used, 300 cfm should be provided for every 200 square feet of floor area. See NFPA No. 204 for additional guidance on smoke control. | The fire hazards analysis (Section 4.0 of the Fire Protection Evaluation dated March 1977) evaluates the protection for these areas (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-32). | | | No further action required. |
| D.4.h <u>Self Contained Breathing Apparatus</u><br><br>Self-contained breathing apparatus, using full face positive pressure masks, approved by NIOSH (National Institute for Occupational Safety and Health - approval formerly given by the U.S. Bureau of Mines) should be provided for fire brigade, damage control and control room personnel. Control room personnel may be furnished breathing air by a manifold system piped from a storage reservoir, if practical. Service or operating life should be a minimum of one-half hour for the self-contained units. | Self-contained breathing units (Scott Air Packs) are provided (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-32). | D4h-1: Self contained breathing apparatus and spare air tanks are available in locations as specified in the Fire Brigade Equipment table (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 6). | At least 10 SCBAs are provided for emergency use. (RG001680, NRC FP SER, 2/14/79, Section 4.4.3). | There are 20 SCBAs provided for emergency use located throughout the plant per Procedure No. SC-3.15.15. |
| At least two extra air bottles should be located onsite for each self-contained breathing unit. In addition, an onsite 6 hour supply of reserve air should be provided and arranged to permit quick and complete replenishment of exhausted supply air bottles as they are returned. If compressors are used as a source of breathing air, only units approved for breathing air should be used. Special care must be taken to locate the compressor in areas free of dust and contaminants. | Adequate reserve air supplies will be provided as specified (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-32). | | Each unit has two spare bottles. The plant has the capability to supply breathing air to 10 men for six hours at the rate of three (1/2 hour) bottles per man hour. A compressor and cascade system are provided on site to supply this breathing air. (RG001680, NRC FP SER, 2/14/79, Section 4.4.3). | DA-ME-99-073 documents compliance with this commitment. |

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| D.4.i Ventilation in Areas with Gas Extinguishing Systems<br><br>Where total flooding gas extinguishing systems are used, area intake and exhaust ventilation dampers should close upon initiation of gas flow to maintain necessary gas concentration. (See NFPA 12, "Carbon Dioxide Systems", and 12A, "Halon 1301 Systems.") | Where Halon 1301 is used, ventilation systems are adequately controlled, see fire hazrds analysis (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-33). | Computer Room supply and exhaust ducts are provided with smoke dampers to prevent the loss of Halon. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 25). | | No further action required. System modified under PCR 96-125. MUX room was isolated from Control Room HVAC system. |
| D.5 Lighting and Communication | | | | |
| Lighting and two-way voice communication are vital to safe shutdown and emergency response in the event of fire. Suitable fixed and portable emergency lighting and communication devices should be provided to satisfy the following requirements: | | The fire brigade and security force have independent radio communication equipment. The only shared equipment is the paging/ intercom system (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 7). | There are three communication systems within the plant. There is adequate redundancy with these three systems to assure good communication throughout the plant during any fire emergency. (RG001680, NRC FP SER dated 2/14/79, Section 4.7) | No further action required. |
| | | The spatial separation of the building quadrants precludes the inoperability of all communications to the containment building in the event of a fire in one of the penetration areas (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 29). | There are three communication systems within the plant. There is adequate redundancy with these three systems to assure good communication throughout the plant during any fire emergency. (RG001680, NRC FP SER, 2/14/79, Section 4.7) | No further action required. |
| | | D5-1: Portable radios and their associated battery chargers are located in each of the four fire equipment lockers (RG009126, RG&E/ NRC, 6/9/78, Enclosure 1, Item 6). | There are three communication systems within the plant. There is adequate redundancy with these three systems to assure good communication throughout the plant during any fire emergency. (RG001680, NRC FP SER, 2/14/79, Section 4.7) | Radios are maintained per procedure 0-6.11 (TSR 2001-0191).<br><br>All fire brigade qualified personnel wear radios as part of their normal responsibilities. Dedicated special purpose radios were determined to be unnecessary. |
| D.5.a Fixed Emergency Lighting<br><br>Fixed emergency lighting should consist of sealed beam units with individual 8-hour minimum battery power supplies. | Emergency lighting powered from station batteries is provided for the Control Room and Containment Vessel. Emergency lighting powered from emergency AC safety related switchgear is provided in the Service Building, Turbine Building, Containment Vessel, and Auxiliary Building. Sealed beam battery powered exit lights are located throughout the plant. This lighting is not deemed adequate for fighting a fire in dense smoke. Portable battery powered units are available for this purpose. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-33). | D5-2: Eight-hour rated fixed emergency lighting units are provided in safety related areas and other areas which contain major fire hazards to facilitate emergency operations, manual fire fighting, and access and egress from each of the fire zones. These fixed lighting units will be either sealed beam design or halogen lamps (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P9; RG010682, RG&E/NRC, 9/1/78; RG001562, RG&E/ NRC, 10/31/78, Item P9). | Eight-hour rated, fixed, sealed beam or halogen lamp emergency lighting units will be provided in safety-related areas and other areas which contain major fire hazards to facilitate the emergency operation, manual fire fighting, and access to, and egress from each fire area (RG001680, NRC FP SER, 2/14/79, Sections 3.1.23 and 4.6). | Emergency lighting was analyzed in Design Analysis DA-NS-92-118-00 dated 11/23/92 under EWR 10022. |

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| D.5.b Portable Hand Lighting<br><br>Suitable sealed beam battery powered portable hand lights should be provided for emergency use. | D5-1: Battery powered handlights are provided in the emergency equipment lockers (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-33). | Ten battery powered emergency lights, each with a spare battery, are provided in the four fire brigade equipment lockers located throughout the plant (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 6). | Portable battery powered handlights are provided (RG001680, NRC FP SER, 2/14/79, Section 4.6). | No further action required. |
| D.5.c Emergency Communication<br><br>Fixed emergency communication should use voice powered headsets at pre-selected stations. | Voice powered headsets and PA system are provided for emergency communications (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-33). | | There is a sound powered phone system and a radio paging system (RG001680, NRC FP SER, 2/14/79, Section 4.7). | No further action required. |
| D.5.d Fixed Repeaters for Portable Radios<br><br>Fixed repeaters installed to permit use of portable radio communication units should be protected from exposure fire damage. | The plant has no repeater stations (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-34). | | The radio paging system has no repeaters, but does provide communication to within the containment with the help of a radio antenna mounted in the containment (RG001680, NRC FP SER, 2/14/79, Section 4.7). | No further action required. Upgrades under Appendix R installed a repeater to enhance radio communications per Procedure A-56. |
| E. Fire Detection and Suppression | | | | |
| E.1 Fire Detection | | | | |
| E.1.a Code Compliance<br><br>Fire detection systems should, as a minimum comply with NFPA 72D, "Standard for the Installation, Maintenance and Use of Proprietary Protective Signaling Systems."<br><br>Deviations from the requirements of NFPA 72D should be identified and justified. | E1a-1: Fire detection systems comply with NFPA 72D, except that no recorder is provided. This deviation is acceptable since adequate records are kept. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-34) | | E1a-1: Fire detection systems comply with NFPA 72D, except that no recorder is provided and some alarm signal sounding circuits are not supervised. The lack of automatic recording is acceptable because the Control Room is constantly manned. (RG001680, NRC FP SER, 2/14/79, Section 4.2) | No further action required. See also the NFPA code conformance in Appendix D of this report. |
| | | | The signal sounding circuits between the local fire control units and the control room will be supervised to detect and annunciate circuit breaks, ground faults, and power supply failures (RG001680, NRC FP SER, 2/14/79, Sections 3.1.42 and 4.2). | Supervision was provided under EWR 1832B. |
| | | | The system also monitors water flow, fire pump operation, fire pump trouble, and low fire water tank level or pressure (RG001680, NRC FP SER, 2/14/79, Section 4.2). | No further action required. |

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| | | | RG&E will perform a study and/or testing to verify that proper consideration has been given to such factors as ceiling height and configuration ventilation air flow pattern, location and arrangement of plant equipment and combustibles, etc. in determining the type, number and location of fire detectors for existing as well as proposed detector system (RG001680, NRC FP SER, 2/14/79, Sections 3.1.43 and 4.2). | No further action required. |
| | | After the design of fire detection systems utilizing the NFPA 72 series as a guide, the following will be done. Portable smoke detectors will be installed in locations which are to be tested. Smoke generators will be used to test. Detector adequacy will be based on time differential. If relocation of detectors is found necessary, the new locations will be verified by test. (RG001798, RG&E/NRC, 4/30/79). | The required methodology for the in-situ smoke detector test is beyond the current state-of-the-art and, therefore, an in-situ test cannot be performed at this time. We find that with acceptable bench testing, and considering that smoke detection systems meet NFPA codes, the existing smoke detectors are acceptable. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 1). | Design Analysis DA-ME-2000-052 documented the acceptability of the installed plant detection systems. |
| E.1.b <u>Fire Detection Alarms to Control Room</u><br><br>Fire detection system should give audible and visual alarm and annunciation in the control room. Local audible alarms should also sound at the location of the fire. | Not all areas are provided with local alarms. All alarms do sound in the Control Room (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-34). | Visual system alarms are denoted by zone on the Control Room fire annunciation panels (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 34). | The fire protective signaling system alarms locally in selected parts of the plant and transmits fire alarm, supervisory, and trouble signals to the control room (RG001680, NRC FP SER, 2/14/79, Section 4.2). | No further action required. |
| E.1.c <u>Fire Detection Alarms</u><br><br>Fire alarms should be distinctive and unique. They should not be capable of being confused with any other plant system alarms. | E1a-1 and E1c-1: Fire alarms in the Control Room are not distinctive but will be made so (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-34). | | E1a-1 and E1c-1: Fire alarms in the Control Room are not distinctive but will be made so (RG001680, NRC FP SER, 2/14/79, Sections 3.1.12 and 4.2). | Installed under EWR 1832B. |
| E.1.d <u>Fire Detection System Power Supply</u><br><br>Fire detection and actuation systems should be connected to the plant emergency power supply. | Plant detection systems are connected to the plant emergency power supply system or are battery operated (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-34). | | Plant detection systems are connected to the plant emergency power supply system or are battery operated (RG001680, NRC FP SER, 2/14/79, Section 4.2). | No further action required. |
| | | | | |
| E.2 <u>Fire Protection Water Supply Systems</u> | | | | |

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| E.2.a <u>Fire Main System Piping</u><br><br>An underground yard fire main loop should be installed to furnish anticipated fire water requirements. NFPA 24, "Standard for Outside Protection," gives necessary guidance for such installation. It references other design codes and standards developed by such organizations as the American National Standards Institute (ANSI) and the American Water Works Association (AWWA). | Section 4.0 of the Fire Protection Evaluation provides a description of the fire protection water supply (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-34). | | A separate 10 inch discharge line from each fire pump supplies the 8 and 10 inch interior loop main. All automatic and manual fixed water suppression systems and interior hose stations are supplied by this loop main. (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.3) | No further action required. |
| Lined steel or cast iron pipe should be used to reduce internal tuberculation. Such tuberculation deposits in an unlined pipe over a period of years can significantly reduce water flow through the combination of increased friction and reduced pipe diameter. Means for treating and flushing the systems should be provided. | The yard main is cast iron. Flushing is accomplished by utilizing hydrants. No means for treatment are installed. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-34). | | | No further action required. |
| Approved visually indicating sectional control valves, such as Post Indicator Valves, should be provided to isolate portions of the main for maintenance or repair without shutting off the entire system. Visible location marking signs for underground valves is acceptable. Alternative valve position indicators should also be provided. | Post indicator valves were not installed originally, therefore, location signs for exterior valves have been installed (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-34). | | Key-operated (curb) sectional valves are provided on the exterior yard main to subdivide it into sections so that a single section can be isolated without impairing the entire system (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.3). | No further action required. |
| The fire main system piping should be separate from service or sanitary water system piping. For operating plants, fire main system piping that can be isolated from service or sanitary water system piping is acceptable. | The fire water piping is not tied into the domestic water service, with the exception of the sprinkler system in the unattached warehouse and the yard hydrants (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-35). | | | Plant fire water system is separated from the yard loop fire system which supplies exterior hydrants and various fire suppression systems for various non-power block buildings. |
| E.2.b <u>Multi-Unit Fire Main System Piping</u><br><br>A common yard fire main loop may serve multi-unit nuclear power plant sites, if cross-connected between units. Sectional control valves should permit maintaining independence of the individual loop around each unit. For such installations, common water supplies may also be utilized. The water supply should be sized for the largest single expected flow. For multiple reactor sites with widely separated plants (approaching 1 mile or more), separate yard fire main loops should be used. Sectionalized systems are acceptable. | N/A | N/A | N/A | N/A |

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| E.2.c Fire Pumps<br><br>If pumps are required to meet system pressure or flow requirements, a sufficient number of pumps should be provided so that 100% capacity will be available with one pump inactive (e.g., three 50% pumps or two 100% pumps). The connection to the yard fire main loop from each fire pump should be widely separated, preferably located on opposite sides of the plant. | There are two vertical fire pumps, one electric and one diesel, located in the Screen House. Each pump is rated at 2000 gpm and 125 psig. Both pumps start on a drop in system pressure. The pumps feed the distribution system at two locations. See also E.2.e below. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 4.15-1, 5-35) | E2c-1: One electric and one diesel driven fire pump are installed, each capable of supplying the maximum water demand (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Items 59, 60). | Two pumps, one electric and one diesel, are provided to supply water. Each has a rated output of 2,000 gpm at 125 psig which is adequate to meet the largest anticipated water demand. (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.2) | No further action required.<br><br>Fire pumps were upgraded under PCR 2001-0038. Design Analysis DA-ME-2001-031 documents the installed capabilities. |
| Each pump should have its own driver with independent power supplies and control. At least one pump (if not powered from the emergency diesels) should be driven by non-electrical means, preferably diesel engine. Pumps and drivers should be located in rooms separated from the remaining pumps and equipment by a minimum three-hour fire wall. | | | | |
| Alarms indicating pump running, driver availability, or failure to start should be provided in the control room. | | | | |
| Details of the fire pump installation should, as a minimum, conform to NFPA 20, "Standard for the Installation of Centrifugal Fire Pumps." | | E2c-2: RG&E will develop procedures for testing the diesel driven fire pump batteries on a periodic basis, for testing the diesel oil in the day tank and for operating the diesel for a minimum of 1/2 hour each month (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P33; RG010682, RG&E/NRC, 9/1/78). | Specific procedures covering the diesel fire pump testing and maintenance have been revised to include battery surveillance, testing of diesel oil in day tank, and to require the diesel engine be operated for a minimum of 1/2 hour each month (RG001680, NRC FP SER, 2/14/79, Sections 3.1.29 and 4.3.1.2).<br><br>- The Technical Specifications require a 15 minute test not a 1/2 hour test. Therefore, the SER paragraphs should be corrected to reflect a 15 minute test. As discussed with the NRC Staff, the 15 minute test is adequate to determine operability (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 6). | Monthly 15 minute minimum test is performed via an installed timer and verified by Operations. |
| E.2.d Fire Water Supply (Tanks)<br><br>Two separate reliable water supplies should be provided. | The water is supplied from Lake Ontario through a reliably constructed intake structure. In addition, the yard hydrant system, supplied by the Town of Ontario, can be used as a backup to feed fixed protection systems and inside hose stations by feeding through wall hydrants (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 4.15-1, 4.15-2). | | The fire protection water supply is provided by Lake Ontario. The water supply for the fire hydrants on the yard fire main is provided from the Town of Ontario. The yard hydrant system can be used as a backup to the fixed protection systems and inside hose stations through wall hydrants in four locations. (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.1) | No further action required. A dry hydrant drafting assembly was installed in the discharge canal per PCR 2003-0036. |

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| If tanks are used, two 100% (minimum of 300,000 gallons each) system capacity tanks should be installed. They should be so interconnected that pumps can take suction from either or both. However, a leak in one tank or its piping should not cause both tanks to drain. The main plant fire water supply capacity should be capable of refilling either tank in a minimum of eight hours. Common tanks are permitted for fire and sanitary or service water storage. When this is done, however, minimum fire water storage requirements should be dedicated by means of a vertical standpipe for other water services. | N/A | N/A | N/A | N/A |
| E.2.e Fire Water Supply Capacity and Flow Rate<br><br>The fire water supply (total capacity and flow rate) should be calculated on the basis of the largest expected flow rate for a period of two hours, but not less than 300,000 gallons. This flow rate should be based (conservatively) on 1,000 gpm for manual hose streams plus the greater of:<br>1. All sprinkler heads opened and flowing in the largest designed fire area; or<br>2. The largest open head deluge system(s) operating. | The maximum fire flow demand is the deluge system for the condenser pit which requires 1988 GPM. A single pump is capable of flowing 3000 GPM at 80 PSI running at 150% rated capacity. The maximum fire flow demand projected for safe shutdown related areas is the cable tunnel which requires 800 GPM (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-37). | | RG&E will evaluate the operating condition of the fire pumps to determine whether repair or replacement is necessary (RG001680, NRC FP SER, 2/14/79, Sections 3.2.7 and 4.3.1.2) | Pumps tested and evaluated. See below. |
| | | Recent fire pump tests indicate that neither pump is in good operating condition. It was determined that both pumps require replacement. (RG001891, RG&E/NRC, 6/29/79; RG002621, RG&E/NRC, 6/4/80) | RG&E will replace the internals of both fire pumps and will perform a test of the repaired pumps (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 6). | Pumps upgraded under EWR 2778 and under PCR 2001-0038. |

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| E.2.f Fire Water Supply (Lakes or Rivers)<br><br>Lakes or fresh water ponds of sufficient size may qualify as sole source of water for fire protection, but require at least two intakes to the pump supply. When a common water supply is permitted for fire protection and the ultimate heat sink, the following conditions should also be satisfied:<br>1. The additional fire protection water requirements are designed into the total storage capacity; and<br>2. Failure of the fire protection system should not degrade the function of the ultimate heat sink. | Lake Ontario is the primary source of fire water. The intake structure is reliably constructed, therefore, two intakes would not greatly improve system reliability. As outlined in Section 4.0 of the Fire Protection Evaluation dated March 1977, a separate water supply for the yard hydrants provides an additional backup (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-37). | | The fire protection water supply is provided by Lake Ontario. The water supply for the fire hydrants on the yard fire main is provided from the Town of Ontario. The yard hydrant system can be used as a backup to the fixed protection systems and inside hose stations through wall hydrants in two locations. (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.1) | No further action required. A dry hydrant drafting assembly was installed in the discharge canal per PCR 2003-0036. |
| E.2.g Outside Manual Hose Installations<br><br>Outside manual hose installation should be sufficient to reach any location with an effective hose stream. To accomplish this, hydrants should be installed approximately every 250 feet on the yard main system. The lateral to each hydrant from the yard main should be controlled by a visually indicating or key-operated (curb) valve. | There is a yard system that is connected to the water supply of the Town of Ontario which supplies outside hydrants around the plant. A hose cart inside the plant is also provided for use with the outside hydrants. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.15-2). | | Yard fire hydrants have been provided at approximately 250 foot intervals and the exterior of the plant (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.3) | No further action required. See the Fire Response Plans. A dry hydrant drafting assembly was installed in the discharge canal per PCR 2003-0036. |
| A hose house, equipped with hose and combination nozzle, and other auxiliary equipment recommended in NFPA 24, "Outside Protection," should be provided as needed but at least every 1,000 feet. | | B5b-7: RG&E will provide external hose houses equipped with the list of equipment identified in NRC Position 20 documented in NRC letter to RGE (RG008784) dated 7/20/78. (RG010682, RG&E/NRC, 9/1/78). | RG&E agreed to provide exterior hose houses containing fire fighting equipment as described in Section 3.1.26 of the SER (RG001680, NRC FP SER, 2/14/79, Sections 3.1.26 and 4.3.1.3). | Four exterior hose houses have been provided per the Fire Response Plans. The hose houses contain the suggested equipment per Procedure No. SC-3.15.15. |
| | | E2g-1: Hydrants and post indicator valves within 25 feet of roadways will be provided with impact barriers (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P31; RG010682, RG&E/NRC, 9/1/78). | RG&E will install impact barriers to protect those fire hydrants and post indicator valves which are located within 25 feet of roadways (RG001680, NRC FP SER, 2/14/79, Sections 3.1.22 and 4.3.1.3). | Verified per FPE walkdown. |
| | | E2g-2: A procedure will be developed encompassing snow removal around exterior fire equipment (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P32; RG010682, RG&E/NRC, 9/1/78; RG001721, RG&E/NRC, 3/13/79, Attachment A Item 5). | Specific administrative procedures will be developed and implemented for snow removal operations to provide access to all exterior hydrants, wall hydrants, post indicator valves, and exterior hose houses/cabinets during and following show storms (RG001680, NRC FP SER, 2/14/79, Sections 3.1.22 and 4.3.1.3). | Provided by Procedure No. SC-3.19. |

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| | | E2g-3: The ground area around each exterior hydrant will be regraded to provide a clearance of not less than 12 inches between the ground and the center of the lowest hydrant port (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P31; RG010682, RG&E/NRC, 9/1/78). | The ground area surrounding each exterior hydrant will be regraded to provide a clearance of not less than 12 inches between the ground and the center of the lowest hydrant port (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.3). | Verified per FPE walkdown. |
| | | | To ensure that fire hydrants will be free from freezing problems, administrative procedures will be established to inspect all outdoor fire hydrants for drainage of their dry-barrels immediately prior to freezing winter weather, and for proper function immediately after the winter season (RG001680, NRC FP SER, 2/14/79, Sections 3.1.44 and 4.3.1.3). | Provided for in Procedure No. FPS-6. |
| Threads compatible with those used by local fire departments should be provided on all hydrants, hose couplings, and standpipe risers. | Hydrant threads are compatible with local fire department apparatus (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-38). | | Threads on hydrant outlets and hose couplings are compatible with those of fire departments which serve the plant (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.3). | No further action required. |
| E.3 <u>Water Sprinklers and Hose Standpipe Systems</u> | | | | |
| E.3.a <u>Standpipe Feed Piping</u><br><br>Each automatic sprinkler system and manual hose station standpipe should have an independent connection to the plant underground water main. Headers fed from each end are permitted inside buildings to supply multiple sprinkler and standpipe systems. When provided, such headers are considered an extension of the yard main system. The header arrangement should be such that no single failure can impair both the primary and backup fire protection systems. | To reduce the extent of a system outage for maintenance or due to system failure, two additional sectional isolation valves will be installed in the turbine building loop at column line 5 and B and in the feed form the service building at column lines 4 and C. When modifications are made in the auxiliary building and intermediate building to provide water spray systems, isolation valves will be provided for the standpipe systems. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.15-3). | A4-1: A single failure does not impair both primary and back-up fire suppression capabilities (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 3).<br><br>- All fixed suppression systems will be fed separately from the hose stations in an area. A secondary water supply and isolation valves will be installed where necessary so that all hoses in a given building cannot be out of service from one break or other event (RG002065, RG&E/NRC, 9/28/79) | E3a-1: Appropriate modifications will be provided to prevent isolation of a section of fire water piping system from causing the loss of both the fixed suppression and manual hose coverage for the same area (RG001680, NRC FP SER, 2/14/79, Sections 3.1.40 and 4.3.1.3).<br><br>- Modifications will be provided to reduce the number of interior hose stations made unavailable in the event of an isolation in the interior fire loop (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2 and 4.3.1.3).<br><br>- Planned modifications are for the purpose of preventing isolation of both fixed protection and hoselines that protect the same area, not for reducing the number of interior hose stations that might be isolated if one section of the piping were taken out of service (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 12). | Modifications performed under EWR 1833. Only exception is hose stations that are provided within the Service Building since they are interconnected with the building suppression system piping. |
| Each sprinkler and standpipe system should be equipped with OS&Y (outside screw and yoke) gate valve, or other approved shutoff valve, and water flow alarm. | Each sprinkler system has an OS&Y shutoff valve. Each individual hose station has a small OS&Y valve. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-38). | | | No further action required. |

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| Safety related equipment that does not itself require sprinkler water fire protection, but is subject to unacceptable damage if wetted by sprinkler water discharge, should be protected by water shields or baffles. | Fire suppression systems outlined in the fire hazards analysis will include as planned modifications the protection of safety related systems and components from unacceptable damage from failure or inadvertent operation. The modifications include installation of water spray shields over the control rod drives motor control center and switchgear in the intermediate building; switchgear and motor control center in the auxiliary building; and installation of curbs around the manhole covers to the cable vaults below the diesel generator rooms (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 4.2-7, 4.3-7, 4.5-2, 4.5-3, 5-6). | | D3c-3: Water spray shields will be installed in the intermediate building over the control rod drive motor control center and switchgear, and in the auxiliary building over the bus 16 switchgear. Watertight manhole covers at the manholes between the diesel generator rooms and the vaults below have been provided (RG001680, NRC FP SER, 2/14/79, Sections 3.1.7, 3.1.14, 4.3.1.5, 5.3.6, 5.4.6, 5.5.6).<br><br>- RG&E will also include this consideration in its on-going study (suppression effects) to preserve the safe shutdown capability (RG001680, NRC FP SER, 2/14/79, Section 4.3.1.5). | Water spray shields installed under EWR 1833. Ginna references for documenting installation of the watertight manhole covers were not located but walkdown by the FPE was completed to verify installation. |
| | | A5-1: All water sprinkler systems in S/R areas are manual except the cable tunnel system which will be converted to an automatic system. Safety related cables in the tunnel would not be affected by sprinkler system flood waters (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 4).<br><br>- The new automatic water suppression systems will be actuated in accordance with NFPA 13 and/or 15 except the systems for the cable trays in the relay room which will be manually operated (RG002621, RG&E/NRC, 6/4/80, Enclosure 1, pg. 1). | The proposed water suppression systems will be automatically actuated, including the existing cable tunnel water suppression system (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 2). | All systems are not manually actuated except for the systems in the Relay Room and the TDAFW system S14. These were installed under EWR 1833 with the electrical interfaces installed under EWR 1832B. Suppression system S24, condenser pit, also requires manual actuation. |
| | | A5-2: It is reasonable to assume that a ruptured fire line that presents a potential flooding situation would be detected early enough to prevent flooding by supplementing the normal drain systems with portable pumps (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 4). | | No further action required. |

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| E.3.b Electrical Supervision of Fire Protection System Valves<br><br>All valves in the fire water systems should be electrically supervised. The electrical supervision signal should indicate in the control room and other appropriate command locations in the plant (see NFPA 26, "Supervision of Valves"). When electrical supervision of fire protection valves is not practicable, an adequate management supervision program should be provided. Such a program should include locking valves open with strict key control; tamper proof seals; and periodic, visual check of all valves. | E3b-1: All control valves for deluge, water spray or sprinkler systems are electrically supervised with alarms in the control room. Other important valves on the water system will be either electrically supervised or locked in the proper position. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-38). | | Electrical supervision is provided for valves controlling waterflow into sprinkler or deluge systems. Sectional valves on the interior loop and valves controlling fire pump discharge are locked open. All isolation valves not supervised will be either chained and locked or electrically supervised. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2 and 4.3.1.3) | Electrical supervision of valves was installed under EWR 1832B. Valves which are not supervised are locked in the required position per FPE review. |
| E.3.c Sprinkler System Code Requirements<br><br>Automatic sprinkler systems should, as a minimum, conform to requirements of appropriate standards such as NFPA 13, "Standard for Installation of Sprinkler Systems" and NFPA 15, "Standard for Water Spray Fixed Systems." | Various sprinkler systems throughout the plant meet the design and installation requirements of NFPA 13 and/or 15, except that no fire department connections are provided for individual systems (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-39). | E3c-1: All existing and proposed automatic suppression systems have been or will be designed in accordance with the design and installation requirements of NFPA 13 and/or 15, except that no fire department connections are provided for individual systems (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 32). | | No further action required. System S19 for the Service Building is provided with a fire department connection. |
| E.3.d Interior Manual Hose Installations<br><br>Interior manual hose installation should be able to reach any location with at least one effective hose stream. To accomplish this, standpipes with hose connections, equipped with a maximum of 75 feet of 1 1/2-inch woven jacket-lined fire hose and suitable nozzles should be provided in all buildings, including containment, on all floors and should be spaced at not more than 100-foot intervals. | Hose reels are provided throughout the plant as indicated on the drawings attached to the fire hazards analysis. Fire hose is 1 1/2 inch fabric reinforce rubber hose which does not require drying after use and testing. The pipe size and arrangement is adequate. Hose is tested under line pressure annually. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-39). | Each hose is to be pressure tested to 50 psi greater than the maximum working pressure at least every three years (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item P2; RG008784, NRC Site Evaluation Visit, 7/20/78, Item P2; RG010682, RG&E/NRC, 9/1/78). | | Hose is pressure tested every three years per Procedure No. FPS-14. |

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| Individual standpipes should be of at least 4-inch diameter for multiple hose connections and 2 1/2-inch diameter for single hose connections. These systems should follow the requirements of NFPA 14 for sizing, spacing, and pipe support requirements (NELPIA). Hose stations should be located outside entrances to normally unoccupied areas and inside normally occupied areas. Standpipes serving hose stations in areas housing safety-related equipment should have shutoff valves and pressure reducing devices (if applicable) outside the area. | | E3D-1: In general, hose stations conform to NFPA 14 except signs indicating fire brigade use only, pressure reducers, branch shut-off valves, and a pressure gauge at the top of each standpipe (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 33).<br><br>- All areas containing safety-related equipment or large amounts of combustibles are within 30 feet of the nozzle of at least one of the hose lines (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 33).<br><br>- RG&E will perform a hose stretch test and provide additional modifications necessary to assure that all points in safety-related areas and other plant areas containing major fire hazards can be reached effectively with at least one hose stream (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P34; RG010682, RG&E/NRC, 9/1/78). | RG&E will perform a hose stretch test and provide additional modification as necessary, to assure that all points in safety-related areas, and other plant areas which contain major fire hazards, can be reached effectively by at least one hose stream (RG001680, NRC FP SER, 2/14/79, Sections 3.1.36, 4.3.1.4, and 5.3.6). | DA-ME-94-004 documented compliance with this requirement. |
| | | | F1b-1: A manual hose station will be provided on each level of the reactor containment so that all hazards and safety-related equipment in the area can be reached by at least one effective hose stream (RG001680, NRC FP SER, 2/14/79, Sections 3.1.41 and 5.1.6).<br><br>- Certain safety-related equipment is not combustible and does not require protection. Protection will be provided by means of suppression for any hazards which could affect safety related equipment. (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 19) | Two manual hose stations were provided on each level of the Containment under EWR 1833. |
| | | The hose on hose reels is not UL listed. The hose reels are flow through type with booster type 300 PSI test hose, comparable to Goodyear ORTAC (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 39). | | No further action required. Note: Current hose is UL or ULC listed. |

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| E.3.e Manual Hose Spray Nozzles<br><br>The proper type of hose nozzles to be supplied to each area should be based on the fire hazard analysis. The usual combination spray/ straight-stream nozzle may cause unacceptable mechanical damage (for example, the delicate electronic equipment in the Control Room) and be unsuitable. Electrically safe nozzles should be provided at locations where electrical equipment or cabling is located. | All areas are provided with variable fog-off nozzles. Personnel are adequately trained to make proper use of hose stations. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-40). | | | No further action required. |
| E.3.f Foam Suppression Systems<br><br>Certain fires such as those involving flammable liquids respond well to foam suppression. Consideration should be given to use of any of the available foams for such specialized protection application. These include the more common chemical and mechanical low expansion foams, high expansion foam and the relatively new aqueous film forming foam (AFFF). | Major flammable liquid hazards in the plant areas are adequately protected (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-40). | | | No further action required. |
| E.4 Halon Suppression Systems | | | | |
| The use of Halon fire extinguishing agents should as a minimum comply with the requirements of NFPA No. 12A and 12B, "Halongenated Fire Extinguishing Agent Systems-Halon 1301 and Halon 1211." Only UL or FM approved agents should be used. In addition to the guidelines of NFPA 12A and 12B, preventative maintenance and testing of the systems, including check weighing of the Halon cylinders should be done at least quarterly. | The existing total flooding Halon systems in the computer room and the relay room will be converted to automatic operation and actuated by the existing smoke detection equipment (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 4.4-9, 4.4-11). | D1c-1, E4-1: The manually actuated Halon systems for the relay and computer rooms are to be upgraded to automatic operation. Both systems will have alarm and supervision in accordance with NFPA 12A. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 37). | The manually actuated total-flooding gas fire suppression systems in the relay/cable spreading room and the computer room will be converted to automatic operation (RG001680, NRC FP SER, 2/14/79, Sections 3.1.3, 4.3.2, and 5.9.6). | Systems S07 and S08 were converted under EWR 1833. Smoke detection for automatic operation was installed under EWR 1832B. PCR 96-125 combined both systems into S08. |
| | These systems are designed in accordance with NFPA 12A to deliver a concentration of 5% by volume (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-40). | | The systems are designed to produce a 5 percent concentration in the protected area (RG001680, NRC FP SER, 2/14/79, Section 4.3.2). | |

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| Particular consideration should also be given to:<br>a. minimum required Halon concentration and soak time<br>b. toxicity of Halon<br>c. toxicity and corrosive characteristics of thermal decomposition products of Halon. | | | | |
| | | The Relay Room does not have ductwork entering or leaving the room. The smoke dampers in the Computer Room actuate upon the activation of either the smoke detection or the Halon system. All doors to these rooms have door closers with no hold open devices and are alarmed for security purposes. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 28) | | No further action required. PCR 96-125 removed all ductwork and isolated the MUX room from the stairwell and the Control Room HVAC system and the barrier walls were restored. |
| | Cylinders are provided with pressure gauges to facilitate visual inspections. Cylinders are weight tested annually. This frequency is adequate since gauges are provided. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-40). | | Halon 1301 storage cylinders are currently weight tested semi-annually (RG001680, NRC FP SER, 2/14/79, Section 4.3.2). | Weight tested every 24 months under Procedure No. PT-13.4.33 based upon a performanced based evaluation, DA-ME-97-081. |
| | The emergency procedures and training include references to the toxic and corrosive hazards of Halon 1301 (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-40). | | | The fire response plan for these areas, FRP-19.0, does not refer to the hazards of Halon. PCN to FRP-19.0 was submitted and training verified that lesson plan FFB41C addresses this issue. |
| | The existing one-shot capability of the Halon system will be supplemented with an onsite storage capability to allow resetting of the protection in the event of inadvertent operation or after a fire is extinguished (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-9). | | A reserve supply of Halon has been provided (RG001680, NRC FP SER, 2/14/79, Sections 3.1.10, 4.3.2, and 5.9.6). | Spare Halon bottles are provided in the Warehouse per Procedure No. PT-13.4.33. |
| | | | RG&E will perform a test of the Halon system in the relay room to demonstrate that the design concentration can be attained and maintained for the specified period of time (RG001680, NRC FP SER, 2/14/79, Section 3.2.3). | A Halon test was performed and subsequent modifications were implemented under EWR 3729 in order to meet 5% concentration for 5 minutes. |
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| E.5 Carbon Dioxide Suppression Systems | | | | |

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| The use of carbon dioxide extinguishing systems should, as a minimum, comply with the requirements of NFPA 12, "Carbon Dioxide Extinguishing Systems." | N/A | N/A | N/A | Fixed $C0_2$ systems are not installed at Ginna. |
| Particular consideration should also be given to:<br>a. minimum required $C0_2$ concentration and soak time;<br>b. toxicity of $C0_2$;<br>c. possibility of secondary thermal shock (cooling) damage;<br>d. offsetting requirements for venting during $C0_2$ injection to prevent over pressurization versus sealing to prevent loss of agent;<br>e. design requirements from over pressurization; and<br>f. possibility and probability of $C0_2$ systems being out-of-service because of personnel safety consideration. $C0_2$ systems are disarmed whenever people are present in an area so protected. Areas entered frequently (even though duration time for any visit is short) have often been found with $C0_2$ systems shut off. | | | | |
| E.6 <u>Portable Extinguishers</u> | | | | |
| Fire extinguishers should be provided in accordance with guidelines of NFPA 10 and 10A, "Portable Fire Extinguishers Installation, Maintenance, and Use." Dry chemical extinguishers should be installed with due consideration given to cleanup problems after use and possible adverse effects on equipment installed in the area. | Portable fire extinguishers are provided and maintained in accordance with NFPA 10 (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-41). | | Pressurized water, dry chemical, and carbon dioxide portable fire extinguishers have been distributed throughout the plant in accordance with the provisions of NFPA 10 (RG001680, NRC FP SER, 2/14/79, Section 4.3.3). | The FRPs show the locations of fire extinguishers throughout the plant. These are maintained and inspected under Procedure No. SC-3.15.3. |
| | Portable fire extinguishers are available at the personnel access hatch to Containment. During a shutdown, portable extinguishers are provided at work locations in Containment requiring a flame permit. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-43) | | | No further action required. |

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| | Portable fire extinguishers will be provided upon completion of construction of the SAF building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.10-3). | | Portable fire extinguishers will be provided in the Standby Auxiliary Feedwater Pump Building (RG001680, NRC FP SER, 2/14/79, Section 5.13.6). | Portable fire extinguishers are currently located in the SAF building per the FRPs. |
| F. Guidelines for Specific Plant Areas | | | | |
| F.1 Primary and Secondary Containment | | | | |
| F.1.a Normal Operation<br><br>Fire protection requirements for the primary and secondary containment areas should be provided on the basis of specific identified hazards. For example:<br>• Lubricating oil or hydraulic fluid system for the primary coolant pumps:<br>• Cable tray arrangements and cable penetrations; or<br>• Charcoal filters.<br>• Fire suppression systems should be provided based on the fire hazards analysis. | The fire hazards analysis (Section 4.0 to the FPE) identified that an existing television monitoring system is installed at each reactor coolant pump to detect a fire in these areas (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.1-3) | Detection will be provided in every area that contains safety related equipment. Safety related equipment is located in the containment area. (RG001562, RGE/NRC, dated 10/31/78, Response to RAI#77) | Early warning fire detection systems will be installed throughout the reactor containment (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.1.6). | Systems Z08, Z13, Z14, Z15, and Z16 were installed in the RCP areas via EWR 1832B. These systems are heat detection except Z16 which includes both heat and smoke detection.<br><br>CATS 10039 documented the completion of DA-ME-2000-052.<br><br>Z16 smoke detectors were upgraded under ECP-12-000198 |
| | Install a curb around the reactor coolant pumps to prevent an oil leak from spreading beyond the pump area (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.1-3) | D2a-4, D2a-5: Curbs around the Reactor Coolant Pumps to enclose an area large enough to contain all of the lubricating oil and a suppression system will be provided or an oil collection system will be installed (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 16, P3; RG001721, RG&E/NRC, 3/13/79, Attachment A Item 1). | Curbs will be installed in reactor containment on the floor within the secondary shield walls. An oil collection system will be provided for each reactor coolant pump to contain lube oil and drain leaked oil to a safe place or a suppression system will be provided (RG001680, NRC FP SER, 2/14/79, Sections 3.1.4, 3.1.39, 4.5 and 5.1.6) | Oil collection systems were installed under EWR 2462. |
| | | A curb will be installed around the reactor coolant pump only if an automatic suppression system is installed . If an oil collection system is installed, no curbs are required. (RG001721, RGE/NRC, dated 3/13/79, Att. 1 FP SER Item 1.1.4).<br><br>An oil collection system will be installed for the reactor coolant pumps (RG002248, RG&E/NRC, 12/18/79). | Based on the NRC's review, they conclude that RG&E's RCP oil collection system meets the fire protection guidelines (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 4). | |
| Fixed fire suppression capability should be provided for hazards that could jeopardize safe plant shutdown. Automatic sprinklers are preferred. | | | | |

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| An acceptable alternate is automatic gas (Halon or $C0_2$) for hazards identified as requiring fixed suppression protection. | | | | |
| An enclosure may be required to confine the agent if a gas system is used. Such enclosures should not adversely affect safe shutdown, or other operating equipment in containment. | | | | |
| Automatic fire suppression capability need not be provided in the primary containment atmospheres that are inerted during normal operation. However, special fire protection requirements during refueling and maintenance operations should be satisfied as provided below. | | | | |
| F.1.b Refueling and Maintenance | | | | |
| Refueling and maintenance operations in containment may introduce additional hazards such as contamination control materials, decontamination supplies, wood planking, temporary wiring, welding, and flame cutting (with portable compressed fuel gas supply). Possible fires would not necessarily be in the vicinity of fixed detection and suppression systems. | Portable fire extinguishers are available at the personnel access hatch. During a shutdown, portable extinguishers are provided at work locations requiring a flame permit. No hose stations are provided. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-43) | | F1b-1: A manual hose station will be provided on each level of the reactor containment so that all hazards and safety-related equipment in the area can be reached by at least one effective hose stream (RG001680, NRC FP SER, 2/14/79, Sections 3.1.41 and 5.1.6).<br><br>- Certain safety-related equipment is not combustible and does not require protection. Protection will be provided by means of suppression for any hazards which could affect safety related equipment. (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 19) | Two manual hose stations were provided on each level of the Containment under EWR 1833. |
| Management procedures and controls necessary to assure adequate fire protection are discussed in section 3.a. | An open flame permit system addresses this (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-43). | | | Issued for all hot work within the protected area per Procedure No. A-905. |
| In addition, manual fire fighting capability should be permanently installed in containment. Standpipes with hose stations, and portable fire extinguishers, should be installed at strategic locations throughout containment for any required manual fire fighting operations. Equivalent protection from portable systems should be provided if it is impractical to install standpipes with hose stations. | | | | Two manual hose stations were provided on each level of the Containment under EWR 1833. |
| Adequate self-contained breathing apparatus should be provided near the containment entrances for fire fighting and damage control personnel. These units should be independent of any breathing apparatus or air supply systems provided for general plant activities. | | | | SCBA equipment available at the centrally located fire brigade equipment area and SSEV. |

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| F.2 Control Room | | | | |
| The control room is essential to safe reactor operation. It must be protected against disabling fire damage and should be separated from other areas of the plant by floors, walls, and roofs having minimum fire resistance ratings of three hours. | The north wall and floor of the control room do not have a 3 hour fire rating (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-43). | | RG&E will provide a one hour rated fire barrier between the kitchen area and the control room (RG001680, NRC FP SER, 2/14/79, Sections 3.1.49 and 5.10.6). | Wall installed under EWR 1837. Suppression system S29 installed under EWR 1833 for North wall. |
| Control room cabinets and consoles are subject to damage from two distinct fire hazards:<br>a. Fire originating within a cabinet or console; and<br>b. Exposure fire involving combustibles in the general room area. | Either a 2 hour fire barrier or an adequate water curtain will be installed between the turbine building and the control room (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-13). | D1a-4, F2-1: A bullet proof, pressure resistant, steel barrier, between the Turbine Building and the Control Building will be installed. An automatically operated water curtain will be provided. (RG009331, RG&E/NRC, 2/6/78; RG001509, RG&E/NRC, 8/25/78; RG002065, RG&E/NRC, 9/28/79). | A double-feed water curtain system will be installed over the steel diaphragm, currently under construction, which separates the control room from the operating floor of the turbine building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 3.1.21, 4.11, 5.10.6, and 5.11.6<br><br>The water curtain protection proposed by RG&E will adequately protect the wall between the control room and the turbine building (RG002940, NRC FP SER Supplement 1, 12/17/80 pg. 2, 3). | The automatic water curtain actuated by heat detection (System S29) was installed under EWRs 1832B and 1833.<br><br>The pressure wall was installed by EWR 1836. |
| Hose stations adjacent to the control room with portable extinguishers in the control room are acceptable. | Hose stations are provided adjacent to the Control Room. Portable extinguishers are provided in the Control Room. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-43). | | | No further action required. |
| Nozzles that are compatible with the hazards and equipment in the control room should be provided for the manual hose station. The nozzles chosen should satisfy actual fire fighting needs, satisfy electrical safety and minimize physical damage to electrical equipment from hose stream impingement. | Multi-purpose variable fog-off nozzles are provided (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-44). | | | No further action required. |
| Fire detection in the control room cabinets and consoles should be provided by smoke and heat detectors in each fire area. Alarm and annunciation should be provided in the control room. Fire alarms in other parts of the plant should also be alarmed and annunciated in the control room. | Smoke detectors are provided in the ventilation exhaust duct (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-44).<br><br>Early warning fire detection will be provided for the instrument cabinets in the control room (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-13). | F2-3, D1a-2: Each safety-related cabinet and console which is enclosed by an essentially complete and continuous surface will be provided with a fire detector. Interconnected consoles and panels will be provided with fire detectors appropriate to their physical characteristics (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item P4; RG008784, NRC Site Evaluation Visit, 7/20/78, Item P4; RG010682, RG&E/NRC, 9/1/78; RG001721, RG&E/NRC, 3/13/79, Attachment A Item 37). | A smoke detector will be installed in each safety-related cabinet/console to provide early warning (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.10.6). | System Z19 was installed in the control room under EWR 1832B. CATS 10040 evaluated compliance with the commitment. |

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| Breathing apparatus for control room operators should be readily available. Control room floors, ceiling, supporting structures, and walls, including penetrations and doors, should be designed to a minimum fire rating of three hours. All penetration seals should be air tight. | Scott Air Packs are provided in a cabinet just outside the control room. The penetrations are sealed with silicon rubber and are air tight. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-44). | | | No further action required. SCBAs are located in the Control Room. |
| The control room ventilation intake should be provided with smoke detection capability to automatically alarm locally and isolate the control room ventilation system to protect operators by preventing smoke from entering the control room. Manually-operated venting of the control room should be available so that operators have the option of venting for visibility. Manually-operated ventilation systems are acceptable. | | | | Control room ventilation system is provided with means to isolate outside air supply. |
| Cables should not be located in concealed floor and ceiling spaces. All cables that enter the control room should terminate in the control room. That is, no cabling should be simply routed through the control room from one area to another. If such concealed spaces are used, however, they should have fixed automatic total flooding Halon protection. | No concealed spaces exist (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-44). | | | No further action required. |
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| F.3 Cable Spreading Room | | | | |
| F.3.a With Divisional Separation<br><br>The preferred acceptable methods are: | | | | |

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| 1. Automatic water system such as closed head sprinklers, open head deluge, or open directional spray nozzles. Deluge and open spray systems should have provisions for manual operation at a remote station; however, there should also be provisions to preclude inadvertent operation. Location of sprinkler heads or spray nozzles should consider cable tray sizing and arrangements to assure adequate water coverage.<br><br>Cables should be designed to allow wetting down with deluge water without electrical faulting.<br><br>Open head deluge and open directional spray systems should be zoned so that a single failure will not deprive the entire area of automatic fire suppression capability.<br><br>The use of foam is acceptable, provided it is of a type capable of being delivered by a sprinkler or deluge system, such as an Aqueous Film Forming Foam (AFFF). | Water spray is not advocated because of the potential damage to relay cabinets in the Relay Room/Cable Spread Area. See alternate b.3 below. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-45). | D1c-3, D3f-2, F3a-1: Either a manually operated water suppression system will be installed in the Relay Room or all the cable trays in the Relay Room will be provided with an appropriate flame retardant coating. If a water suppression system is installed, it will be isolated with a manual valve to preclude inadvertent operation (RG001562, RG&E/NRC, 10/31/78, Enclosure, Item P35). | All cable trays in the relay room will be covered with flame retardant coating or a manually operated water suppression system will be installed (RG001680, NRC FP SER, 2/14/79, Sections 3.1.15 and 5.9.6). | Three (3) manually operated water suppression systems, S09, S10 and S11, were installed under EWR 1833. |
| 2. Manual hoses and portable extinguishers should be provided as backup. | Portable extinguishers are provided in the area. Hose reels are available in the Turbine Building adjacent to the Relay Room and from outside yard hydrants (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-8, 5-45). | | | No further action required. |
| 3. Each cable spreading room of each unit should have divisional cable separation, and be separated from the other and the rest of the plant by a minimum three-hour rated fire wall. (Refer to NFPA 251 or ASTM E-119 for fire test resistance rating). | The doors in the fire barriers between the relay room and the computer room, stair tower, and the turbine building will be replaced with B-labeled, 1 1/2 hour rated doors including the B-labeled door between the turbine building and the relay room. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-9). | | D1j-7: All doors in the barriers enclosing the area will be replaced with 1 1/2 hour fire doors (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, and 5.9.6).<br><br>Section 4.9.1 of the above SER calls for the door between the relay room and the computer room to be upgraded to a three hour labeled door. (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 16). | Doors F502, F504 and F507 were replaced under EWR 1837. These doors were replaced with 3 hour fire rated doors per the Fire Door Manual information. Fire door F507 was removed under PCR 96-125. |
| 4. At least two remote and separate entrances are provided to the room for access by fire brigade personnel; and | The plant meets this criterion. Three entrances are provided (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-45). | | | No further action required. |
| 5. Aisle separation provided between tray stacks should be at least three feet wide and eight feet high. | Cable trays are installed well above floor level. Access for manual suppression activities is adequate. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-46). | | | No further action required. |

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| F.3.b Without Divisional Separation<br><br>For cable spreading rooms that do not provide divisional cable separation of (a) 3, in addition to meeting (a) 1, 2, 4, and 5 above, the following should also be provided: | | | | |
| 1. Divisional cable separation should meet the guidelines of Regulatory Guide 1.75, "Physical Independence of Electric Systems," | The fire protection proposed is sufficient to prevent involvement of redundant safe shutdown equipment. Physical separation does not meet Regulatory Guide 1.75 in all cases. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-46). | | | Part of SER Items 3.2.1 and 3.2.2 which are considered part of Appendix R. See Appendix B to this report. |
| 2. All cabling should be covered with a suitable fire retardant coating. | Cables are not covered by a fire retardant coating (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-46). | | | |
| 3. As an alternate to (a) 1 above, automatically initiated gas systems (Halon or $C0_2$) may be used for primary fire suppression, provided a fixed water system is used as a backup. | A total flood Halon system is provided. Water by hose stream application supplements the Halon systems. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-8,5-46). | D1c-3, D3f-2, F3a-1: Either a manually operated water suppression system will be installed in the Relay Room or all the cable trays in the Relay Room will be provided with an appropriate flame retardant coating. If a water suppression system is installed, it will be isolated with a manual valve to preclude inadvertent operation (RG001562, RG&E/ NRC, 10/31/78, Enclosure, Item P35). | All cable trays in the relay room will be covered with flame retardant coating or a manually operated water suppression system will be installed (RG001680, NRC FP SER, 2/14/ 79, Sections 3.1.15 and 5.9.6). | Manually operated water suppression systems were installed under EWR 1833. |
| | The existing total flooding Halon systems in the computer room and the relay room will be converted to automatic operation and actuated by the existing smoke detection equipment (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 4.4-9, 4.4-11). | D1c-1, E4-1: The manually actuated Halon systems for the relay and computer rooms are to be upgraded to automatic operation. Both systems will have alarm and supervision in accordance with NFPA 12A. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 37). | The manually actuated total-flooding gas fire suppression systems in the relay/cable spreading room and the computer room will be converted to automatic operation (RG001680, NRC FP SER, 2/14/79, Sections 3.1.3, 4.3.2, and 5.9.6). | Systems S07 and S08 were converted under EWR 1833. Smoke detection for automatic operation was installed under EWR 1832B. PCR 96-125 combined systems S07 and S08 into S08. |
| | The existing one-shot capability of the Halon system will be supplemented with an onsite storage capability to allow resetting of the protection in the event of inadvertent operation or after a fire is extinguished (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-9). | | A reserve supply of Halon has been provided (RG001680, NRC FP SER, 2/14/79, Sections 3.1.10, 4.3.2, and 5.9.6). | Spare Halon bottles are provided in the Warehouse per Procedure No. PT-13.4.33 for system S08. |
| 4. Plants that cannot meet the guidelines of Regulatory Guide 1.75, in addition to meeting (a) 1, 2, 4 and 5 above, an auxiliary system with all cabling independent of the cable spreading room should be provided. | | | | Part of SER Items 3.2.1 and 3.2.2 which are considered part of Appendix R. See Appendix B to this report. |
| | The cable spreading/relay room will not be used for the storage of operational records and supplies (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-9). | | | Procedure No. FPS-16 governs the storage of both permanent and transient combustibles in this area. |

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| | Automatic fire detection is provided by ionization type smoke detectors backed up by rate of rise type heat detectors (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-8). | | Fire detection is provided by smoke detectors and rate-of- rise heat detectors. (RG001680, NRC FP SER, 2/14/79, Section 5.9.4) | |
| | The walls enclosing the Computer Room have a 2 hr fire resistance rating. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4.5). | | Barriers which do not have 3 hr ratings include: the 2 hr rated barriers separating the Computer Room from the Relay Room. Fire barriers in the plant will be adequate to contain fires and are therefore acceptable. (RG001680, NRC FP SER, 2/14/79, Section 4.11) | PCR 96-125 combined the computer room with the relay room and fire door F507 was removed. |
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| F.4 Plant Computer Room | | | | |
| Safety-related computers should be separated from other areas of the plant by barriers having a minimum three-hour fire resistant rating. Automatic fire detection should be provided to alarm and annunciate in the control room and alarm locally. Manual hose stations and portable water and Halon fire extinguishers should be provided. | The plant computer room is in the Relay/ Cable Spread Room. The walls of the room are 2 hour and the ceiling is unrated. The computer is not required for safe plant shutdown. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-46)<br><br>The ceiling of the computer room will be replaced with a one hour fire barrier and the combustibles in the room will be reduced to protect redundant safe shutdown related cable above the ceiling (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-11) | | RG&E will replace the existing computer room ceiling with a one hour rated assembly (RG001680, NRC FP SER, 2/14/79, Sections 3.1.6, 4.11, and 5.9.6).<br><br>The rating of barriers between the Computer Room and the Relay Room will be upgraded to three hours or the combustibles in the Computer Room be reduced to the level that can be contained by the proposed barriers (RG001680, NRC FP SER, 2/14/79, Sections 3.1.38, 4.11, and 5.9.6).<br><br>Note: SER section 4.11 is not consistent, Computer Room ceiling 3 hr vs 1 hr . | A 1 hr ceiling was installed under EWR 1837. The computer room is a combustible control zone under Procedure No. FPS-16. |
| | Fire dampers will be installed in the supply and exhaust ducts for the computer room to retard the spread of fire through the ventilation system (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-10). | Fire dampers will be installed in the supply and exhaust ducts for the Computer Room. Only smoke dampers currently exist. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 25). | Ventilation ducts to the computer room will be protected by fire dampers (RG001680, NRC FP SER, 2/14/79, Sections 3.1.9 and 5.9.6). | Fire dampers RR-117 and RR-120 through RR-123 were installed under EWR 2463. The computer room was isolated from the control room HVAC system and ductwork which breaches fire walls were removed under PCR 96-125 and the fire barrier walls were restored. |

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| | The doors in the fire barrier between the relay room and the computer room will be replaced with B-labeled, 1 1/2 hour rated doors (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-9). | | D1j-6: RG&E will replace many 1 1/2 hour rated doors and unrated doors with 3 hour doors (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, 4.9.1, 5.4.6, 5.5.6, and 5.8.6).<br><br>- Section 4.9.1 of the above SER calls for the door between the relay room and the computer room to be upgraded to a three hour labeled door. The requirement is a 1 1/2 hour, B labeled door (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 16). | Door F507 was removed under PCR 96-125 and the room was combined with system S08. |
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| | The existing total flooding Halon systems in the Cable Spreading/Relay Room and Computer Room will be converted to automatically actuate to protect redundant safe shutdown equipment in the Relay Room (pp. 4.4-9, 4.4-11), | D1c-1, E4-1: The manually actuated Halon systems for the relay and computer rooms are to be upgraded to automatic operation. Both systems will have alarm and supervision in accordance with NFPA 12A. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 37). | The manually actuated total-flooding gas fire suppression systems in the relay/cable spreading room and the computer room will be converted to automatic operation (RG001680, NRC FP SER, 2/14/79, Sections 3.1.3, 4.3.2, and 5.9.6). | Systems S07 and S08 were converted under EWR 1833. Smoke detection for automatic operation was installed under EWR 1832B. Systems S07 and S08 were combined into system S08 under PCR 96-125. |
| | Automatic fire detection is provided by ionization type smoke detectors. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-10). | | | |
| | | F4-1: Hose stations are located outside the Computer Room and Control Room, $C0_2$ extinguishers are located inside the computer room. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 36) | | No further action required. |
| | The cable spreading/relay room will not be used for the storage of operational records and supplies (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-9). | | | Procedure No. FPS-16 governs the storage of both permanent and transient combustibles in this area. |
| | The walls enclosing the Computer Room have a 2 hr fire resistance rating. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4.5). | | Barriers which do not have 3 hr ratings include: the 2 hr rated barriers separating the Computer Room from the Relay Room. Fire barriers in the plant will be adequate to contain fires and are therefore acceptable. (RG001680, NRC FP SER, 2/14/79, Section 4.11) | PCR 96-125 combined the computer room with the relay room and fire door F507 was removed. |
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| F.5 Switchgear Rooms | | | | |

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| Switchgear rooms should be separated from the remainder of the plant by minimum three-hour rated fire barriers to the extent practicable. Automatic fire detection should alarm and annunciate in the control room and alarm locally. Fire hose stations and portable extinguishers should be readily available. | The plant has no switchgear rooms, per se. Switchgear areas are identified in the fire hazards analysis (Section 4.0 to the FPE dated March 1977). (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-47). | | | See Volume 1 of this report, Fire Hazards Analysis. |
| Acceptable protection for cables that pass through the switchgear room is automatic water or gas agent suppression. Such automatic suppression must consider preventing unacceptable damage to electrical equipment and possible necessary containment of agent following discharge. | Note: The Screen House and the Aux Bldg. at the 253' and 271' elevations contain switchgear. See sections D.1.a, D.2.a, and F.11 to this table for FP commitments applicable to these switchgear areas. | | | |
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| F.6 <u>Remote Safety-Related Panels</u> | | | | |
| The general area housing remote safety related panels should be provided with automatic fire detectors that alarm locally and annunciate in the control room. Combustible materials should be controlled and limited to those required for operation. Portable extinguishers and manual hose stations should be provided. | Combustible materials are controlled in these areas. Manual fire suppression equipment is provided for these areas. The fire hazards analysis details these areas. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-47).<br><br>Note: Numerous plant areas contain safety related panels. See other Appendix summary sections for specific FP commitments applicable to these plant areas. | | | See Procedure No. FPS-16. |
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| F.7 <u>Station Battery Rooms</u> | | | | |
| Battery rooms should be protected against fire explosions. Battery rooms should be separated from each other and other areas of the plant by barriers having a minimum fire rating of three hours inclusive of all penetrations and openings. (See NFPA 69, "Standard on Explosion Prevention Systems.") Ventilation systems in the battery rooms should be capable of maintaining the hydrogen concentration well below 2 volume percent hydrogen concentration. Standpipes and hose and portable extinguishers should be provided. | The Battery Rooms are separated from other areas by a two hour barrier, except for the ceiling. The FHA outlines the requirements for this area. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, 5-47).<br><br>The FHA identifies that the existing 1 1/2 hr doors and the 2 hr barriers are adequate based on fire loading and smoke detection in the rooms. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, 4.4-6). | | Barriers that do not contain 3 hr ratings consist of the following: the 2 hr rated walls between the battery rooms and the mechanical equipment room. Fire barriers in the plant will be adequate to contain fires and is therefore, acceptable. (RG001680, NRC FP SER, 2/14/79, Section 4.11)<br><br>Unprotected openings in the barriers enclosing the rooms, exposed structural steel, and the electrical cable tray in the "B" room containing redundant safety divisions exist. We will address the adequacy of fire protection for this area in a supplement to this report. (RG001680, NRC FP SER, 2/14/79, Section 5.7.6). | Structural steel in the battery rooms was protected to a one hour rating under Appendix R, EWR 4175. |

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| Alternatives:<br>a. Provide a total fire rated barrier enclosure of the battery room complex that exceeds the fire load contained in the room, or<br>b. Reduce the fire load to be within the fire barrier capability of 1 1/2 hours, or,<br>c. Provide a remote manual actuated sprinkler system in each room and provide the 1 1/2 hour fire barrier separation. | The FHA also identifies that modifications to the ventilation system are planned to minimize the potential for flow of smoke and hot gasses into the battery rooms from adjacent areas and between the battery rooms. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.4-6). | An air conditioning unit will be installed to supply supplemental cooling to the battery rooms. This a/c unit will be installed in the mech. equip room. In addition, 1 1/2 hour fire dampers will be installed in all wall openings, including ductwork, in the Battery Room. (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 52).<br><br>A fan will be installed on the air inlet to the Battery Rooms (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item P5). | Each ventilation opening in all barriers will be protected by a 1 1/2 hour rated, automatic fire damper (RG001680, NRC FP SER, 2/14/79, Sections 3.1.11, 5.7.6, and 5.11.6). | A temporary AC unit was installed under EWR 1100 and later made permanent.<br><br>Unit was upgraded under PCR 96-084.<br><br>Dampers were installed under EWR 1100. |
| | | To provide additional conservatism in the design, the amount of makeup air will be increased. A minimum factor of safety of 5 will be utilized in calculating the amount of makeup air required under worst case conditions (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Item P19). . | RG&E will increase the amount of makeup air to provide a factor of safety of at least 5 under the worst condition. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.11, 4.4.4, and 5.7.6). | PCR 96-084 documented the required makeup air rate. |
| | | Constant makeup air to the battery rooms is assured by a fixed makeup air damper and by the backup vent system. An engineering calculation will be performed to determine min damper setting. (RG002621, RGE/NRC, dated 6/4/80, Item 3.1.11) | The minimum air flow setting will be based on engineering calculations for the maximum H2 generation rate for the batteries. (RG002940, NRC FP SER, Sup. 1, dated 12/17/80, p 2). | |
| | | Air flow monitors will be installed in each of the station battery rooms and annunciate the loss of ventilation air flow in the Control Room (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Item P5 and RG002621, RGE/NRC, dated 6/4/80, Item 3.1.11). | F7-2: Ventilation airflow monitors will be provided in each of the Battery Rooms to alarm and annunciate the loss of air flow in either room (RG001680, NRC FP SER, 2/14/79, Sections 3.1.11, 4.4.4, and 5.7.6; RG002940, NRC FP SER Supplement 1, 12/17/80 pg. 2). | A review of P&ID 33013-1868 was completed and it was verified that these devices are installed. |
| | The existing ionization type smoke detection and manual fire suppression equipment is adequate protection for the hazards in the room. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, 4.4-6). | | Smoke detectors are provided in the battery rooms. A manual hose and portable extinguishers are available from the Turbine Bldg. (RG001680, NRC FP SER, 2/14/79, Section 5.7.4) | |
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| F.8 <u>Turbine Lubrication and Control Oil Storage and Use Areas</u> | | | | |

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| A blank fire wall having a minimum resistance rating of three hours should separate all areas containing safety-related systems and equipment from the turbine oil system. When a blank wall is not present, open head deluge protection should be provided for the turbine oil hazards and automatic open head water curtain protection should be provided for wall openings. | No safety related equipment is exposed to the turbine oil storage areas. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-48). | | | No further action required. |
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| F.9 Diesel Generator Areas | | | | |
| Diesel generators should be separated from each other and other areas of the plant by fire barriers having a minimum fire resistance rating of three hours. | The diesel generators meet this criterion (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-48).<br><br>The wall between the Diesel Generator Rooms is 12" concrete block. All other walls enclosing the rooms are 12" reinforced concrete. The fire areas are separated by a 12" reinforced concrete wall with sealed pipe penetrations. This exceeds the requirements of a 3 hr rated barrier. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p 4.5-1) | A bullet proof, pressure resistant, steel barrier, between the Turbine Building and the Diesel Generator Rooms will be installed. This wall provides for over pressure protection in the event of a high energy line break and for protection from postulated fires. (RG009331, RG&E/NRC, 2/6/78; RG001509, RG&E/NRC, 8/25/78;). | Fire barriers in the plant will be adequate to contain fires and are therefore acceptable. (RG001680, NRC FP SER, 2/14/79, Sections 4.11).<br><br>The two diesel Rooms are separated by a 3 hr rated fire barrier. (RG001680, NRC FP SER, 2/14/79, Sections 5.3.3). | Pressure resisting wall installed under EWR 1836. |
| | The 1 1/2 hr rated fire doors in the wall separating this zone from the Turbine Building provide adequate separation based on dikes and drains to contain diesel oil spills and water from the deluge system. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p 4.5-1) | | Each Diesel Generator Room is protected from fire by a wall capable of 3 hr fire resistance with B labeled fire doors. (RG001680, NRC FP SER, 2/14/79, Sections 5.3.4). | Fire doors F29 and F30 are currently labeled three hour rated fire doors. |
| | The door closers on the doors from the turbine building to the diesel generator rooms will be adjusted to ensure closure against the pressure differential created by the turbine building ventilation system (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-3). | | The door closers on the fire doors between each Diesel Generator Room and the Turbine Building will be adjusted to ensure that the door close against the pressure differential created by the ventilation system in the Turbine Building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.16 and 5.3.6). | These are doors F29 and F30. This same problem was covered under EWR 5108 for other doors not including F29 and F30. Fire doors are monitored under procedure FPS-15. These doors have been verified to operate properly and appropriate closure devices are installed. |
| | In the DG-2 room cable vault, spray on type fire retardant coating will be applied to the power cable for both generators within five feet of the duct bank to the Auxiliary Building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-5), | | D1c-2, D3f-1: A flame retardant coating will be applied to the power cables for both diesel generators within 5 feet of the duct bank to the Auxiliary Building located in the cable vault below Diesel Generator Room B (RG001680, NRC FP SER, 2/14/79, Sections 3.1.15 and 5.3.6). | Installed under EWR 1832 |

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| | The metal enclosure separating the power cables from both diesel generators will be sealed at the floor in Cable Vault below DG-2 (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-5), | | D1j-9: The metal barrier between the power cables from both emergency generators located in the cable vault below generator B will be sealed at the floor (RG001680, NRC FP SER, 2/14/79, Sections 3.1.8 and 5.3.6). | This barrier was sealed under EWR 1850 and upgraded under PCR 2002-0018. |
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| Automatic fire suppression such as AFFF or sprinklers should be installed to combat any diesel generator or lubricating oil fires.<br><br>Automatic fire detection should be provided to alarm and annunciate in the control room and alarm locally. Drainage for fire fighting water and means for local manual venting of smoke should be provided. | The diesel generator is protected by an open head deluge system (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-49). | F9-3: The suppression systems covering the diesel generators will be changed from manual to automatic actuation (RG008784, NRC Site Evaluation Visit, 7/20/78, Item P16; RG010682, RG&E/NRC, 9/1/78). | The existing manually actuated water suppression systems protecting the emergency generator rooms will be modified to be actuated automatically (RG001680, NRC FP SER, 2/14/79, Sections 3.1.19 and 5.3.6). | Systems S12 and S13 were converted to automatic operation actuated by heat detection under EWRs 1833 and 1832B. |
| | Early warning detectors will be installed in the cable vaults below the diesel generators (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-3), | | An early warning fire detection system will be installed in the cable vault under each diesel generator room (RG001680, NRC FP SER, 2/14/79, Sections 3.1.1 and 5.3.6). | Systems Z20 and Z21 were installed under EWR 1832B. |
| | In the Diesel Generator Rooms, a curb will be installed around the manhole cover to prevent oil or water from entering the cable vault. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.5-3). | | A water tight cover for the manholes opening to each cable vault in the diesel generator rooms has been installed. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.14). | Field verification by the FPE verified the installation of the manhole covers. |
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| | | RG&E will provide protection commensurate with the hazard for the section of service water piping for the "B" diesel that passes through the A diesel room (RG009792, RG&E/NRC, 9/22/78, Attachment 1, Item P17). | F9-1, F9-2: The section of service water piping for "B" diesel which passes through "A" room will be protected to assure cooling of "B" diesel in the event of a fire in "A" room (RG001680, NRC FP SER, 2/14/79, Sections 3.1.20 and 5.3.6)<br><br>- The "A" and "B" designations in the SER are reversed (RG001721, RG&E/NRC, 3/13/79, Attachment A Item 4). | Protection for this piping section was provided under EWR 1833 and evaluated under CATS 10075. Refer to TSR 97-201 and DA-ME-2000-062 for additional information. |
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| Day tanks with total capacity up to 1100 gallons are permitted in the diesel generator area under the following conditions: | | | | |

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| a. The day tank is located in a separate enclosure, with a minimum fire resistance rating of three hours, including doors or penetrations. These enclosures should be capable of containing the entire contents of the day tanks. The enclosure should be ventilated to avoid accumulation of oil fumes.<br>b. The enclosure should be protected by automatic fire suppression systems such as AFFF or sprinklers. | | | | |
| When day tanks cannot be separated from the diesel generator one of the following should be provided for the diesel generator areas:<br>a. Automatic open head deluge or open head spray nozzle system(s).<br>b. Automatic closed head sprinklers.<br>c. Automatic AFFF that is delivered by a sprinkler deluge or spray system.<br>d. Automatic gas system (Halon or $C0_2$) may be used in lieu of foam or sprinklers to combat diesel generator and/or lubricating oil fires. | | | | Systems S12 and S13 provided preaction system protection of each D/G room. PCR 2001-0021 upgraded both systems |
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| F.10 <u>Diesel Fuel Oil Storage Areas</u> | | | | |
| Diesel fuel oil tanks with a capacity greater than 1100 gallons should not be located inside the buildings containing safety-related equipment. They should be located at least 50 feet from any building containing safety-related equipment, or if located within 50 feet, they should be housed in a separate building with construction having a minimum fire resistance rating of three hours. Buried tanks are considered as meeting the three-hour fire resistance requirements. See NFPA 30, "Flammable and Combustible Liquids Code," for additional guidance. | Diesel fuel for the emergency generators is stored in two independent underground tanks (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-49). | | | No further action required. |
| When located in a separate building, the tank should be protected by an automatic fire suppression system such as AFFF or sprinklers. | | | | |

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| Tanks, unless buried, should not be located directly above or below safety-related systems or equipment regardless of the fire rating of separating floors or ceilings. | | | | |
| In operating plants where tanks are located directly above or below the diesel generators and cannot reasonably be moved, separating floors and main structural members should, as a minimum, have a fire resistance rating of three hours. Floors should be liquid-tight to prevent leaking of possible oil spills from one level to another. Drains should be provided to remove possible oil spills and fire fighting water to a safe location.<br><br>One of the following acceptable methods of fire protection should also be provided:<br>a. Automatic open head deluge or open head spray nozzle system(s);<br>b. Automatic closed head sprinklers; or<br>c. Automatic AFFF that is delivered by a sprinkler system or spray system. | | | | N/A |
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| F.11 <u>Safety-Related Pumps</u><br><br>Pump houses and rooms housing safety-related pumps should be protected by automatic sprinkler protection unless a fire hazards analysis can demonstrate that a fire will not endanger other safety-related equipment required for safe plant shutdown. Early warning fire detection should be installed with alarm and annunciation locally and in the control room. | Note: The line by line response to App. A (Section 5.0 to the FPE) identifies FP commitments relative to the Screen House area only. Other plant areas such as the Aux. Bldg, Intermediate Bldg, and the SAF contain pumps used for safe shutdown. See sections D.1.a, and D.2.a for additional FP commitments applicable to safety related pump areas. | | | |
| | <u>Screenhouse</u><br><br>The Screen House area containing the service water pumps will be protected with a wet pipe closed head sprinkler system (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-50). | F11-1, D1a-4: A standard automatic sprinkler system will be installed over the service water pumps in the Screen House (RG002065, RG&E/NRC, 9/28/79).<br><br>The new automatic water suppression systems will conform to the provisions of applicable NFPA codes and will be automatically actuated. (RG002621, RGE/NRC, 6/4/80) | An automatic sprinkler system will be installed over the area where the fire pumps and service water pumps are located (RG001680, NRC FP SER, 2/14/79, Sections 3.1.2, 4.3.1.2, 4.3.1.5, 5.2.6).<br><br>The system is required to be automatically actuated (RG002940, NRC FP SER Supplement 1, 12/17/80, pg. 2) | System S18 was installed in area of columns 5-6 and A-E under EWR 1833. |

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| | Early warning detection will be installed in the area enclosed by column lines 5 and 6, A and E of the screen house (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.6-6) | | Early warning fire detection will be installed in the area of the fire pumps and service water pumps in the screen house (RG001680, NRC FP SER, 2/14/79, Section 5.2.6). | System Z26 was installed under EWR 1832B. System S17 includes smoke detection and was installed under EWRs 1832B and 1833. |
| | To protect redundant service water pumps, the diesel fuel storage tank for the fire pump in the Screen House will be relocated to a safe outside location with a thermally operated shutoff valve where the fuel line enters the building (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.6-6) | A curb will be provided for the diesel driven fire pump area to contain all of the fuel from a full day tank. In addition, the drain will carry this fuel to a buried holding tank with sufficient capacity to contain all the diesel fuel. The holding tank will be larger than the diesel fuel day tank (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 16 and 55). | Curbs will be installed in the screen house around the diesel fire pumps and oil storage tank. A drain will be installed in the curbed area to carry leaking diesel to a holding tank buried outside the building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.4, 4.3.1.2, 4.5 and 5.2.6) | Curbed area and drain/tank are each capable of holding the entire contents plus an additional 10%. These were installed under EWR 1834A. |
| | | | | |
| Local hose stations and portable extinguishers should also be provided. | Local hose stations and portable extinguishers are provided in the Screen House.(RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-50). | | | No further action required. |
| Equipment pedestals or curbs and drains should be provided to remove and direct water away from safety-related equipment. | Equipment in the Screen House is installed on concrete curbs. Adequate drainage for water is provided. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-50). | | | No further action required. |
| Provisions should be made for manual control of the ventilation system to facilitate smoke removal if required for manual fire fighting operation. | A large overhead door in the Screen House is suitable for smoke removal (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-50). | | | No further action required. |
| | | | The licensee will verify that the auxiliary boiler conforms to the applicable provisions of the current edition to NFPA 85, or identify and justify deviations. (RG001680, NRC FP SER, 2/14/79, Section 3.1.46, 5.2.6). | |
| | | The auxiliary boiler was purchased to conform to the ASME Boiler code, all requirements of Factory Mutual, and approval by Underwriters' Laboratories as a unit. ANI also inspected the boiler. NFPA-85, 1976 was reviewed and deviations were noted. (RG002065, RGE/NRC, dated 9/28/79). | The licensee has identified deviations of the auxiliary boiler from the current edition of NFPA 85, and indicated that the boiler meets requirements of ANI and Hartford Steam Boiler. We reviewed the deviations and conclude that the present arrangement of the boiler is acceptable. (RG003007, NRC FP SER Supplement 2, 2/6/81, pg 2) | No further actions required. |

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| | All metal deck roofs were specified to be FM Class I, except for the Screen House. The Screen House roof is a metal deck supported by unprotected steel and is not Class I. The roof construction does not present a serious fire hazard. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, pp. 4.6-3, 4.6.7, 5-23) | | RG&E will conduct a study to determine what active and passive systems should be installed to control fires in high fire load areas to prevent structural failures that could jeopardize safe shutdown of the plant. This study will interface with the safe shutdown study and will be complete in December 1979 (RG001680, NRC FP SER, 2/14/79, Section 3.2.8). | Requirements for fire protection of structural steel in the Screen House was addressed as part of the Appendix R analysis. |
| | | The Screen House contains the diesel fire pump oil tank. A curb has been provided to contain oil and an automatic wet pipe sprinkler system is being installed to protect the service water pumps and fire pumps. Smoke detection is provided in the area. (RG002659, RG&E/NRC, 6/30/80). | RG&E should protect the structural steel in the areas of the Screen House. RG&E response to exposed structural steel in the Screen House is not acceptable. This area is identified as not being in compliance with Appendix R, and is considered to be an open item which will be required to meet Appendix R requirements. (RG003007, NRC FP SER Supplement 2, 2/6/81)<br><br>(RG003007, NRC FP SER Supplement 2, 2/6/81, pg. 3). | The current safe shutdown analysis for App. R demonstrates shutdown from outside the area. Steel in the area is not protected. |
| F.12 New Fuel Area | | | | |
| Hand portable extinguishers should be located within this area. Also, local hose stations should be located outside but within hose reach of this area. Automatic fire detection should alarm and annunciate in the control room and alarm locally.<br><br>Combustibles should be limited to a minimum in the new fuel area. The storage area should be provided with a drainage system to preclude accumulation of water. | New fuel is stored in a metal enclosure and is separated from all combustibles. Hose stations and portable fire extinguishers are provided. Detection will be provided for adjacent hazards in the area. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-51). | | | CATS 10046 addressed how this commitment was addressed. |
| The storage configuration of new fuel should always be maintained as to preclude criticality for any water density that might occur during fire water application. | | | | |
| | | | | |
| F.13 Spent Fuel Pool Area | | | | |
| Protection for the spent fuel pool area should be provided by local hose stations and portable extinguishers. Automatic fire detection should be provided to alarm and annunciate in the control room and to alarm locally. | Manual suppression equipment such as hose stations and portable extinguishers are provided. Automatic detection is provided in the exhaust ventilation duct of the decontamination pit adjacent to the spent fuel pool. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-51) | | | No further action required. |

| Appendix A Guidelines | RG&E Commitment in FPE (3/77) | RG&E Commitment Additions/Revisions Prior to NRC Program Approval | NRC SERs Documenting Program Approval | Current Status /Comments |
|---|---|---|---|---|
| | Automatic fire dampers will be installed over the opening for the spent fuel pool ventilation cleanup charcoal filters in the auxiliary building wall (p. 4.2-11), | | D1j-2, D1j-10: RG&E will install rated fire dampers in duct penetrations in the spent fuel pool ventilation clean-up charcoal filter ducts in the Auxiliary Building. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.9, 4.9.2, and 5.4.6). | Fire dampers 1-411-1 through 1-411-21 were installed under EWR 2463. Fire damper 1-<br>411-21 was upgraded under EWR 4882. |
| | The unrated doors at the entrance to the intermediate building from the auxiliary building elevation 278'-4" will be replaced with A-label, 3-hour rated doors (p. 4.2-11, 4.3-9), | | D1j-6: RG&E will replace existing door with 3 hour door in the auxiliary building to intermediate building at the 278' elevation. (RG001680, NRC FP SER, 2/14/79, Sections 3.1.5, 4.9.1, 5.4.6, 5.5.6, and 5.8.6). | Door F503 was replaced under EWR 1837. This is now a 3 hr door per the Fire Door Manual. |
| | | | | |
| F.14 <u>Radwaste Building</u> | | | | |
| The Radwaste Building should be separated from other areas of the plant by fire barriers having at least three-hour ratings. Automatic sprinklers should be used in all areas where combustible materials are located. Automatic fire detection should be provided to annunciate and alarm in the control room and alarm locally. | The plant has no Radwaste building per se. These facilities are provided in the Auxiliary Building. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-51) | | | There currently is a Radwaste building which is not attached to the power block building. Building is provided with a sprinkler system which is supplied by the exterior fire yard loop system. Fire detection capability is not provided, but fire system actuation provides local and remote annunciation. |
| During a fire, the ventilation system in these areas should be capable of being isolated. Water should drain to liquid Radwaste Building sumps. | | | | Building does not contain ventilation system. Water is contained within the building sump area which does not drain to other areas. Fire system alarms are annunciated in the security building which is manned 24 hours per day. Exterior yard hydrants are available to support manual fire fighting if needed. |
| Acceptable alternative fire protection is automatic fire detection to alarm and annunciate in the control room, in addition to manual hose stations and portable extinguishers consisting of hand-held and large wheeled units. | | | | |
| F.15 <u>Decontamination Areas</u> | | | | |
| The decontamination areas should be protected by automatic sprinklers if flammable liquids are stored. Automatic fire detection should be provided to annunciate and alarm in the control room and alarm locally. The ventilation system should be capable of being isolated. Local hose stations and hand portable extinguishers should be provided as backup to the sprinkler system. | The decontamination areas in the Service Building near the entrance to the controlled areas of the plant are protected by automatic sprinklers. The decontamination pit in the Auxiliary Building has smoke detection in the exhaust ventilation duct. Manual fire suppression equipment is available. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-52) | | | No further action required. |
| F.16 <u>Safety-Related Water Tanks</u> | | | | |

| Appendix A Guidelines | RG&E Commitment in FPE (3/77) | RG&E Commitment Additions/Revisions Prior to NRC Program Approval | NRC SERs Documenting Program Approval | Current Status /Comments |
|---|---|---|---|---|
| Storage tanks that supply water for safe shutdown should be protected from the effects of fire. Local hose stations and portable extinguishers should be provided. Portable extinguishers should be located in nearby hose houses. Combustible materials should not be stored next to outdoor tanks. A minimum of 50 feet of separation should be provided between outdoor tanks and combustible materials where feasible. | The refueling water storage tank spans the three floor elevations of the Auxiliary Building. The fire exposure from the Auxiliary Building is not severe enough to cause damage to the tank. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-52).<br><br>Note: For other Auxiliary Building FP commitments, see sections D.1.a and D.2.a. | | | No further action required. |
| F.17 <u>Cooling Towers</u> | | | | |
| Cooling towers should be of non-combustible construction or so located that a fire will not adversely affect any safety related systems or equipment. Cooling towers should be of non-combustible construction when the basins are used for the ultimate heat sink or for the fire protection water supply. Cooling towers of combustible construction, so located that a fire in them could adversely affect safety-related systems or equipment should be protected with an open head deluge system installation with hydrants and hose houses strategically located. | N/A | N/A | N/A | N/A |
| F.18 <u>Miscellaneous Areas</u> | | | | |
| Miscellaneous areas such as records storage areas, shops, warehouses, and auxiliary boiler rooms should be so located that a fire or effects of a fire, including smoke, will not adversely affect any safety related systems or equipment. Fuel oil tanks for auxiliary boilers should be buried or provided with dikes to contain the entire tank contents. | The plant complies with this except for the plant auxiliary boiler. This gas fired boiler is in the same fire area as the service water pumps and the fire water pumps. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-53). | The auxiliary boiler is installed, inspected, tested, and maintained to a high degree of safety. The minor variations with NFPA Standard 85-1976 do not constitute a hazard nor warrant any changes. (RG002065, RG&E/NRC, 9/28/79, p. 3) | RG&E will verify that the auxiliary boiler conforms to all of the applicable provisions of the current edition of NFPA 85, or identify and justify deviations (RG001680, NRC FP SER, 2/14/79, Sections 3.1.46 and 5.2.6).<br><br>- RG&E has verified that the auxiliary boiler conforms to all of the applicable provision s of the current edition of NFPA 85 with minor deviations that do not constitute a hazard nor warrant any changes (RG003007, NRC FP SER Supplement 2, 2/6/81, p. 2). | No further action required. |
| | The gas meter-regulator station located in the Screen House Basement for the auxiliary boiler will be relocated outside the building away from redundant service water pump power cable trays (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 4.6-3). | | The gas meter-regulator station for the auxiliary boiler will be relocated outside the building (RG001680, NRC FP SER, 2/14/79, Sections 3.1.13 and 5.2.6). | Gas meter relocated under EWR 1834. |
| G. <u>Special Protection Guidelines</u> | | | | |
| G.1 <u>Welding and Cutting, Acetylene-Oxygen Fuel Gas Systems</u> | | | | |

| Appendix A Guidelines | RG&E Commitment in FPE (3/77) | RG&E Commitment Additions/Revisions Prior to NRC Program Approval | NRC SERs Documenting Program Approval | Current Status /Comments |
|---|---|---|---|---|
| This equipment is issued in various areas throughout the plant. Storage locations should be chosen to permit fire protection by automatic sprinkler systems. Local hose stations and portable equipment should be provided as backup. The requirements of NFPA 51 and 51B are applicable to these hazards. A permit system should be required to utilize this equipment. (Also refer to 2f herein.) | Bulk storage of acetylene and oxygen is in an area with sprinklers. In all areas where welding or cutting is done, hose stations and portable fire extinguishers are provided. The only exception to this is outlined under "Refueling." A permit system is used to control open flames in the plant. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-53). | | | Hot work permits are issued per Procedure No. A-905. Containment hose stations were installed under EWR 1833. |
| G.2 Storage Areas for Dry Ion Exchange Resins | | | | |
| Dry ion exchange resins should not be stored near essential safety related systems. Dry unused resins should be protected by automatic wet pipe sprinkler installations. Detection by smoke and heat detectors should alarm and annunciate in the control room and alarm locally. | Dry resins are stored in the sprinkler protected Warehouse, well separated from the main plant. The water flow alarm sounds in the guard house which is continually attended. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-53). | | | No further action required. |
| Local hose stations and portable extinguishers should provide backup for these areas. Storage areas of dry resin should have curbs and drains. (Refer to NFPA 92M, "Waterproofing and Draining of Floors.") | | | | |
| G.3 Hazardous Chemicals | | | | |
| Hazardous chemicals should be stored and protected in accordance with the recommendations of NFPA 49, "Hazardous Chemicals Data." Chemical storage areas should be well ventilated and protected against flooding conditions since some chemicals may react with water to produce ignition. | Very minor amounts of hazardous chemicals may be stored or used in the laboratories in the service building. These facilities are protected with automatic sprinklers and do not present any hazard to safety related or safe shutdown equipment. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-54) | G3-1: Hazardous chemicals are not stored in areas containing safe shutdown equipment (RG009126, RG&E/NRC, 6/9/78, Enclosure 1, Item 19). | | No further action required. |
| G.4 Materials Containing Radioactivity | | | | |
| Materials that collect and contain radioactivity such as spent ion exchange resins, charcoal filters, and HEPA filters should be stored in closed metal tanks or containers that are located in areas free from ignition sources or combustibles. These materials should be protected from exposure to fires in adjacent areas as well. Consideration should be given to requirements for removal of isotopic decay heat from entrained radioactive materials. | New HEPA and charcoal filter and ion exchanger resins are stored in the Warehouse. Spent filters and exchange resins are removed to the east end of the Auxiliary Building operating floor and subsequently packaged for shipment off-site. There are no ignition sources in the area. (RG010540, RG&E Fire Protection Evaluation, 2/24/77, p. 5-54) | | | No further action required. |

# REFERENCES

# CORRESPONDENCE

RG010471, NRC/RG&E, 5/3/76, Subject: NRC has revised SRP-9.5.1 and it will be utilized in reviewing operating plants as applicable.

RG001059, NRC/RG&E, 5/11/76, Subject: Request for RG&E to compare facility to SRP-9.5.1 which includes BTP 9.5-1.

RG009463, NRC/RG&E, 9/28/76, Subject: NRC enclosed Appendix A to BTP 9.5-1; previous FHA submittals not adequate and need a qualified FPE; Request for Technical Specifications for fire protection systems and for compliance date for Section B of Appendix A.

RG001178, NRC/RG&E, 12/1/76, Subject: NRC provides sample Tech Specs and errata sheet for Appendix A to BTP 9.5-1.

RG001199, NRC/RG&E, 1/3/77, Subject: Notice of agenda for site FP Evaluation.

RG010540, RG&E/NRC, 2/24/77, Subject: Submittal of RG&E response to SRP-9.5.1 which includes BTP 9.5-1 and Appendix A to BTP 9.5-1.

RG001339, NRC/RG&E, 8/19/77, Subject: NRC provides a copy of the FRACQA to RG&E for information and use. Document is being used as guidance for review of RG&E organizational and administrative aspects of the FHA.

RG010645, NRC/RG&E, 11/25/77, Subject: NRC enclosed proposed Tech Specs and provided a staff position on fire brigade size.

RG009185, RG&E/NRC, 12/13/77, Subject: RG&E objects to NRC requirements for fire brigade size/testing of fire detectors.

RG009331, RG&E/NRC, 2/6/78, Subject: Describes modifications being performed on the Control Building - Turbine Building common wall and on the Diesel Generator annexes - Turbine Building common wall.

RG001445, NRC/RG&E, 2/14/78, Subject: Request for review of RG&E program with respect to FRACQA guidelines.

RG009236, NRC/RG&E, 3/1/78, Subject: License Amendment No. 15

RG009150, NRC/RG&E, 5/3/78, Subject: Request for additional information to review FHA.

RG009142, RG&E/NRC, 5/15/78, Subject: RG&E response to the FRACQA letter.

RG009127, NRC/RG&E, 6/8/78, Subject: NRC provides "Manpower Requirements for Operating Nuclear Reactors" for guidance in meeting NRC requirements; Re-requests RG&E position with regard to NRC position on fire brigade size.

RG009126, RG&E/NRC, 6/9/78, Subject: Response to NRC request for additional information for the Fire Hazards Analysis.

RG010661, RG&E/NRC, 6/26/78, Subject: RG&E restates that it believes that the minimum fire brigade size should be three.

RG009113, RG&E/NRC, 6/27/78, Subject: Additional copies of 6/9/78 responses.

RG008784, NRC trip report for 6/27-30/78, 7/20/78, Subject: Contains a list of NRC positions and the status of resolution to each position.

RG001509, RG&E/NRC, 8/25/78, Subject: Describes modifications being performed on the control building - turbine building common wall and on the diesel generator annexes - turbine building common wall.

RG010682, RG&E/NRC, 9/1/78, Subject: Responses to staff positions from 7/20/78 trip report.

RG009792, RG&E/NRC, 9/22/78, Subject: Responds to remainder of the staff positions from 7/20/78 trip report.

RG001535, NRC/RG&E, 10/6/78, Subject: Requests additional information to continue review; Provides additional NRC staff positions and requests RG&E response.

RG010689, RG&E/NRC, 10/18/78, Subject: Requests NRC approval for five fire doors to be installed in common wall between control building and the turbine building and for the two doors between the diesel generator rooms and the turbine building.

RG001562, RG&E/NRC, 10/31/78, Subject: Response to most issues in 10/6/78 letter from NRC; Revises RG&E response to positions 9 and 28.

RG001680, NRC/RG&E, 2/14/79, Subject: License Amendment #24; Enclosed 2/14/79 SER.

RG001721, RG&E/NRC, 3/13/79, Subject: RG&E comments, clarifications, and corrections to SER.

RG001732, RG&E/NRC, 3/19/79, Subject: Response to 2/14/79 NRC letter that transmitted modified Technical Specifications, FPSER, and a request for a schedule for submitting additional information.

RG001798, RG&E/NRC, 4/30/79, Subject: Provides additional information for SER Items 3.1.24, 3.1.25, 3.1.43, and 3.2.4.

RG001838, RG&E/NRC, 5/25/79, Subject: Commits to a fire brigade size of five (SER item 3.2.9); Additional information on battery room ventilation (SER item 3.1.11).

RG001858, RG&E/NRC, 6/14/79, Subject: Schedule change for completion date of computer room ceiling (SER item 3.1.6).

RG001891, RG&E/NRC, 6/29/79, Subject: Fire pump testing (SER item 3.2.7).

RG001944, RG&E/NRC, 7/27/79, Subject: Schedule change for curbs around diesel fire pump area in Screen House (SER item 3.1.4).

RG001973, NRC/RG&E, 8/10/79, Subject: October 1980 BTP implementation schedule.

RG002040, NRC/RG&E, 9/14/79, Subject: Staff (generic) position - "Safe Shutdown Capability."

RG002065, RG&E/NRC, 9/28/79, Subject: September information submittals for SER (SER Items 3.1.2, 3.1.8, 3.1.21, 3.1.46, 3.1.48, and 3.2.6).

RG002118, RG&E/NRC, 10/25/79, Subject: Schedule change for service water piping serving A Diesel Generator (SER item 3.1.20).

RG002130, Consultant/NRC, 10/30/79, Subject: Closure of five man fire brigade.

RG002175, RG&E/NRC, 11/14/79, Subject: Application for amendment to operating license (Plant fire brigade - SER item 3.2.9).

RG002248, RG&E/NRC, 12/18/79, Subject: Response to SER items 3.1.39, 3.1.5, 3.1.24, 3.1.34, and 3.2.8.

RG002260, RG&E/NRC, 12/21/79, Subject: Cable penetration test report information (SER item 3.2.5).

RG002271, RG&E/NRC, 12/28/79, Subject: "Ginna Safe Shutdown Fire Study" (SER items 3.2.1 and 3.2.2).

RG002307, NRC/RG&E, 1/23/80, Subject: License Amendment No. 30 - Changes minimum fire brigade shift size from three to five.

RG002400, RG&E/NRC, 2/12/80, Subject: Information on 3.2.5 - Cable penetrations (clarification of proprietary status).

RG002538, NRC/RG&E, 4/25/80, Subject: NRC review of SER submittals and a request for additional information.

RG002591, RG&E/NRC, 5/23/80, Subject: Delays for SER items 3.1.8, 3.1.11, 3.1.21, 3.1.48, 3.1.49.

RG002603, RG&E/NRC, 5/29/80, Subject: Updates on SER items 3.1.5, 3.1.24, 3.1.34, and 3.2.8.

RG002621, RG&E/NRC, 6/4/80, Subject: Response to NRC request for information dated 4/25/80.

RG002659, RG&E/NRC, 6/30/80, Subject: Response to SER item 3.2.8 - exposed structural steel protection.

RG002790, NRC/RG&E, 9/18/80, Subject: Dedicated Shutdown System - Review of 12/28/79 Safe Shutdown Study.

RG002893, NRC/RG&E, 11/24/80, Subject: RG&E should install a dedicated shutdown system under Appendix R to 10 CFR 50.

RG002940, NRC/RG&E, 12/17/80, Subject: Supplement 1 to 2/14/79 SER.

RG002976, RG&E/NRC, 1/26/81, Subject: Schedule extension request from requirements of 10 CFR 50.48(d).

RG003007, NRC/RG&E, 2/6/81, Subject: Supplement 2 to 2/14/79 SER.

RG003034, NRC/RG&E, 2/13/81, Subject: Schedule extension requested in 1/26/81 letter is granted.

RG003106, RG&E/NRC, 3/16/81, Subject: Response to SER item 3.2.8, exposed structural steel submittal.

RG003327, RG&E/NRC, 6/3/81, Subject: Commitment revision - Fire Door supervision (SER Item 3.1.30).

RG003355, RG&E/NRC, 6/19/81, Subject: Schedule extension request from the requirements of 10 CFR 50.48(d) for fire detection system.

RG003357, NRC/RG&E, 6/22/81, Subject: Supplement 3 to 2/14/79 SER; revises the requirements of item 3.1.30 fire door supervision.

RG003384, NRC/RG&E, 6/30/81, Subject: Schedule extension granted for fire detection system.

RG003690, RG&E/NRC, 11/19/81, Subject: Commitment revision - Automatic Suppression.

RG003759, RG&E/NRC, 12/22/81, Subject: System description - Detection power supply modifications.

RG004229, NRC/RG&E, 5/26/82, Subject: SER on Suppression and Detection commitment changes.

IMPELL/RG&E, 11/22/85, Subject: Delivery of Appendix A/FHA Update.

IMPELL/RG&E, 1/20/86, Subject: Appendix A Commitment Matrix Rev 2 (Updated Page 31).

RG&E internal memo, 3/4/86, Subject: Flame Retardant Coating of Cables.

RG&E internal memo, 4/4/86, Subject: Auxiliary Building Charcoal Filter Suppression.

RG&E internal memo, 4/4/86, Subject: Status of Appendix A Action Items.

RG&E internal memo, 4/4/86 (updated from the above memo at a later date), Subject: Detailed status of App. A Action Items (reported completed with supporting documentation).

RG&E internal memo, 4/4/86, Subject: Screen House Structural Steel Protection.

RG&E internal memo, 5/22/89, Subject: P&IDs for suppression systems required for App. A and the NRC's SER.

RG&E internal memo, 10/2/89, Subject: Fire Brigade Size (Includes a correspondence history on this issue).

RG&E internal memo (e-mail), 10/29/92, Subject: Additional Aux Building Charcoal Filter Protection.

RG&E internal memo, 12/21/92, Subject: Deferral of EWR 4327 (deals with charcoal filter protection).

Bechtel Letter, 2/9/98, DiPerna to Ploof, Subject: RCP Motor Lube Oil Collection system Effectiveness Review, Bechtel Document Number ESM-97-09

ECP-10-000834 Rev. 0, Perform a comparison between UL and ULC Standard for fire hose assemblies.

# ENGINEERING WORK REQUESTS (EWRs)

| EWR | Roll | Frame | Drawer | Title/Scope |
|---|---|---|---|---|
| 1086 | 00410 | 0999 | 1C | Complete fire protection system including wiring design changes on Auxiliary Building Charcoal Filter. |
| 1100 | 00410 | 2545 | 1C | Apparent overheating in battery room have caused problems with charger equipment. Review problems and complete design. |
| 1683 | 01154 | 1623 | N/A | General Appendix A compliance; Justification for a 3 man Fire Brigade; Structural steel protection in Turbine Building; Summary document for FPP compliance. |
| 1692 | 00414 | 2816 | 2E | Smoke detection system for new computer card/spare parts storage area in Turbine Building. |
| 1832 | 01160 | 2017 | N/A | Flame retardant coating in east cable vault under DG-B. |
| 1832A | 01173 | 1444 | N/A | Electrical modifications for redundant cables. |
| 1832B | 01174 | 3863 | N/A | Installed/modified plant fire alarm system. |
| 1832C | 01173 | 1288 | N/A | Flamemastic at cable tunnel entrances. |
| 1833 | 01076 | 3466 | N/A | Installation/modifications to plant fire suppression systems. |
| 1834 | 00415 | 2777 | 3B | Relocated gas meter and installed curb/drain at fire pump in Screen House. |
| 1836 | 01007 | 0625 | N/A | Installed pressure walls between the Control Building and the Turbine Building and between the Diesel Generators and the Turbine Building. |
| 1837 | 00416 | 0002 | 3B | Replacement of fire doors; fire door monitoring; installation of new computer room ceiling; fire barrier between Control Room and Kitchen. |
| 1850 | 01113 | 0265 | N/A | Fire seal modifications. |
| 2421 | 00491 | 0214 | 4A | Built new hydrogen storage building and relocated associated piping. |
| 2462 | 00514 | 1393 | 9C | Installed RCP oil collection systems. |
| 2463 | 01138 | 4122 | N/A | Fire damper modifications. |
| 2720 | 00424 | 3567 | 4F | Installed backflow protection for drainage systems. |
| 2778 | 00424 | 4724 | 5A | Replaced fire pumps. |
| 2928 | 00429 | 4715 | 5D | Installed structural protection in turbine oil area. |
| 2940 | 00428 | 5436 | 5D | Installed smoke barrier at Intermediate Building Cable Tunnel opening. |
| 3729 | 00459 | 3526 | 6E | Relay room Halon test and system modifications. |

| EWR | Roll | Frame | Drawer | Title/Scope |
|---|---|---|---|---|
| 4064 | 01427 | 0035 | N/A | Detection and suppression modifications after EWR 1832B. |
| 4871 | 00567 | 4027 | 10e | Installed additional isolation valves in outside fire protection loop. |
| 4932 | 01142 | 4476 | N/A | Intermediate Building fire door F36 fire door. |
| 4941 | 01249 | 0086 | N/A | Evaluated fire barrier penetration seals. |
| 5108 | 01003 | 5440 | N/A | Door closer adjustment and door monitoring. Does not address Diesel Generator Rooms. |
| 10022 | 01098 | 4373 | N/A | Evaluated adequacy of emergency lighting. |
| 10081 | 01389 | 4996 | N/A | Evaluation of Screen House fire detector placement. |
| 10116 | 01144 | 4152 | N/A | Developed the FRPs and organizational chart. |

# APPENDIX B

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

## B-1 Table NFPA 805 Fundamental Fire Protection Program and Design Elements Transition Review

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.1 General** | 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. | None | N/A | - None |
| **3.2.1 Intent** | Intent. A site-wide fire protection plan shall be established. This plan shall document management policy and program direction and shall define the responsibilities of those individuals responsible for the plan's implementation. This section establishes the criteria for an integrated combination of components, procedures, and personnel to implement all fire protection program activities. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 2.0] establishes the Ginna fire protection plan and states: “The Fire Protection Plan describes the controls associated with the Ginna Fire Protection Program; identifies the organizations and positions responsible for the fire protection program; describes the authority of positions responsible for implementing the program; and outlines the plans for fire protection, fire detection and suppression capability, and limitation of fire damage. The Fire Protection Plan describes the features necessary to implement the fire protection program such as: administrative controls; personnel requirements for fire prevention and manual fire suppression activities; automatic and manually operated fire detection and suppression systems; and the means to limit fire damage to structures, systems, and components important to safety so that the capability to safely shutdown the plant is ensured.”<br><br>Additionally, CC-AA-211 delineates the responsibility and authority for implementation of the fire protection program. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program |

# B-1 Table NFPA 805 Fundamental Fire Protection Program and Design Elements Transition Review

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.2.2<br>Mgmt Policy Direction & Responsibility** | Management Policy Direction and Responsibility. A policy document shall be prepared that defines management authority and responsibilities and establishes the general policy for the site fire protection program. | Complies | CC-AA-211 serves as the policy document that defines management authority and responsibilities and establishes the general policy for the site fire protection program. Management authority and responsibilities are also described by the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 7.0]. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program |
| **3.2.2.1<br>Sr Management Position Designation** | The policy document shall designate the senior management position with immediate authority and responsibility for the fire protection program. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 7.1] and CC-AA-211 state, “The site fire protection program is under the direction of the Site Vice President who has available the following staff knowldegeable in both fire protection and nuclear safety. The staff is responsible for the formulation, implementation, and assessment of the effectiveness of the program.”<br><br>The Vice President is considered the senior management position with immediate authority and responsibility for the fire protection program. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program |
| **3.2.2.2<br>Daily Admin & Coord Designation** | The policy document shall designate a position responsible for the daily administration and coordination of the fire protection program and its implementation. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 7.0] and CC-AA-211 serve as the policy document and assign responsibilities for daily fire protection program administration, coordination, and implementation. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program |
| **3.2.2.3<br>Define the Fire Protection Interfaces** | The policy document shall define the fire protection interfaces with other organizations and assign responsibilities for the coordination of activities. In addition, this policy document shall identify the various plant positions having the authority for implementing the various areas of the fire protection program. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 7.0], and CC-AA-211 serve as the policy documents that define the fire protection interfaces with other organizations and assign responsibilities for coordination of activities. Additionally, they identify the plant positions having authority for implementing the various areas of the fire protection program. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program |

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| **3.2.2.4 Identify the Appropriate AHJ** | The policy document shall identify the appropriate AHJ for the various areas of the fire protection program. | Complies | CC-AA-211 specifies the appropriate AHJ for the various areas of the fire protection program including Nuclear Safety, Life Safety, Occupational Safety, and Property Loss. | - CC-AA-211, Fire Protection Program |
| **3.2.3 Procedures** | Procedures shall be established for implementation of the fire protection program. In addition to procedures that could be required by other sections of the standard, the procedures to accomplish the following shall be established: | None | This is a general statement section. Please refer to the following subsections for the specific NFPA 805 subsection requirements and the compliance statement for each. | - None |
| **3.2.3(1) Inspections** | Inspection, testing, and maintenance for fire protection systems and features credited by the fire protection program | Submit for NRC Approval | NRC approval is requested for the ability to utilize performance-based methods to establish the appropriate inspection, testing, and maintenance frequencies for fire protection systems and features required by NFPA 805. Performance-based inspection, testing, and maintenance frequencies will be establishes as described in Electric Power Research Institute (EPRI) Technical Report TR-1006756, "Fire Protection Surveillance Optimization and Maintenance Guide for Fire Protection Systems and Features", Final Report, July 2003.<br><br>See revised Attachment L to the License Amendment Request for Ginna.<br><br>The NRC approved this request (ML15271A101) | - EPRI Technical Report TR 1006756<br>- Supplement to License Amendment to Transition to NFPA 805 dated September 5, 2014.<br>- NFPA 805 LAR NRC Safety Evaluation (ML15271A101) |

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| **3.2.3(2) Compensatory Actions** | 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 | Complies | The Technical Requirements Manual (TRM) [Sec. TR 3.3.4 and 3.7.1 - 3.7.6] specifies the compensatory actions and measures that are to be implemented in the event that fire protection systems, components, or features credited by the Fire Protection Program are degraded inoperable, or impaired. A-52.12 [Sec. 6.7 and Attach. 3] provides control and implementation of fire protection-related compensatory actions. | - Technical Requirments Manual, Technical Requirements Manual<br>- A-52.12, Nonfunctional Equipment Important to Safety |
| **3.2.3(3) Reviews of Fire Protection Program** | Reviews of fire protection program - related performance and trends | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 6.2] and CC-AA-211 [3.1.13] state: "Nuclear Oversight (NOS) is responsible for performing fire protection audits, assessments, and surveillances in accordance with Nuclear Oversight assessment plans and procedures, and site specific Technical Specifications, Technical Requirement Manuals, and/or commitments (QA Topical Report NO-AA-10)". Reviews of Fire Protection Program related performance trends will be addressed via the fire protection program health report along with post-transition NFPA 805 monitoring program. | - NO-AA-10, Quality Assurance Topical Report (QATR)<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program<br>- Fire Protection Program Health Report |
| **3.2.3(4) Reviews of Plant Mods** | Reviews of physical plant modifications and procedure changes for impact on the fire protection program | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 8.5] requires a review of all station modifications and procedure changes for possible impact on Fire Protection Program requirements. These reviews are performed and documented in accordance with CC-AA-102, CC-AA-209, and LS-AA-128-101. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-102, Design Input and Configuration Impact Screening<br>- CC-AA-209, Fire Protection Configuration Change Review<br>- LS-AA-128-101, Regulatory Review of Proposed Changes to the Approved NFPA 805 Fire Protection Program |

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| **3.2.3(5)**<br>**Maintenance of FPP** | Long-term maintenance and configuration of the fire protection program | Complies | Long-term maintenance and configuration control of the fire protection program is governed by CC-AA-211, CC-AA-102, CC-AA-209, and IP-FPP-1. Specifically:<br><br>NO-AA-10 governs the Quality Assurance Program which includes the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 6.2].<br><br>The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 8.1] states: "A regulatory review of the proposed changes to the approved Fire Protection Program (LS-AA-128-101) is required to be performed to determine if a proposed change to the approved fire protection program can be made without prior NRC approval." [Sec. 8.2] states: "Administrative controls shall be established and maintained to control updates to the FPPR. This includes the use of plant procedures to control updates to the FPPR. Administrative requirements should be established for the review and approval of changes to the FPPR. Procedures CC-AA-209 and IP-FPP-1 provide required directions."<br><br>CC-AA-102 and CC-AA-209 are also used for screening the impact on the fire protection program configuration control of the fire protection program during the modification process. | - LS-AA-128-101, Regulatory Review of Proposed Changes to the Approved NFPA 805 Fire Protection Program<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program<br>- CC-AA-102, Design Input and Configuration Impact Screening<br>- CC-AA-209, Fire Protection Configuration Change Review<br>- IP-FPP-1, Fire Protection Program Report (FPPR) Periodic and Continuous Updating<br>- NO-AA-10, Quality Assurance Topical Report (QATR) |
| **3.2.3(6)**<br>**Fire Brigade Response** | Emergency response procedures for the plant industrial fire brigade | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 9.0] establishes the procedural and administrative training requirements for fire brigade personnel, equipment, and fire fighting procedures.<br><br>SC-3 (and daughter SC-3 series procedures) establish and implement the site contingency and emergency | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- SC-3, , Site Contingency Plan |

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| | | | plan. The fire emergency response plan is summarized in SC-3. | |
| **3.3 Prevention** | A fire prevention program with the goal of preventing a fire from starting shall be established, documented, and implemented as part of the fire protection program. The two basic components of the fire prevention program shall consist of both of the following: (1) Prevention of fires and fire spread by controls on operational activities (2) Design control that restrict the use of combustible materials | Complies | A fire prevention program has been established, documented, and implemented as part of the overall Ginna fire protection program. The basic components are:<br><br>(1) Controls on Operational Activities (EPM-FPPR Vol. I, Part II [Sec. 8.0], OP-AA-201-004, OP-AA-201-006, and OP-AA-201-009).<br><br>(2) Combustible Materials Design Controls (EPM-FPPR Vol. I, Part II [Sec. 8.3], CC-AA-209, and CC-AA-102). | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-209, Fire Protection Program Configuration Change Review<br>- CC-AA-102, Design Input and Configuration Change Impact Screening<br>- OP-AA-201-004, Fire Prevention for Hot Work<br>- OP-AA-201-009, Control of Transients<br>- OP-AA-201-006, Control of Temporary Heat Sources |
| **3.3.1 Fire Prevention for Operational Activities** | The fire prevention program activities shall consist of the necessary elements to address the control of ignition sources and the use of transient combustible materials during all aspects of plant operations. The fire prevention program shall focus on the human and programmatic elements necessary to prevent fires from starting or, should a fire start, to keep the fire as small as possible. | Complies | Procedures are in place that adequately control ignition sources (EPM-FPPR Vol. I, Part II [Sec. 8.4], OP-AA-201-004, and OP-AA-201-006). The control of transient combustible materials are governed by EPM-FPPR Vol. I, Part II [Sec. 8.3],OP-AA-201-009, and the aim to minimize the size of fires that may occur during all aspects of plant operations is included in SC-3.3.1, and other Site Contingency procedures (SC-3 series). | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- SC-3.3.1, Immediate Fire Notification<br>- SC-3, Site Contingency Plan<br>- OP-AA-201-004, Fire Prevention for Hot Work- OP-AA-201-006, Control of Temporary Heat Sources<br>- OP-AA-201-009, Control of Transients |

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| **3.3.1.1 General Fire Prevention Activities** | General Fire Prevention Activities. The fire prevention activities shall include but not be limited to the following program elements: | None | This is a general statement section. Please refer to the following subsections for the specific NFPA 805 subsection requirements and the compliance statement for each.<br>Based on review of the fire prevention programmatic controls described in sub-sections 1,2, and 3 below, the NFPA 805, section 3.3.1.1 requirements are satisfied and no other additional elements were evaluated. | - None |
| **3.3.1.1(1) Training** | 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 | Complies | Initial General Employee Training includes the following minimum fire protection program elements as discussed in FAQ 06-0028:<br>- Individual responsibilities regarding fire barriers such as fire dampers, doors, and seals (Exelon Industrial/Nuclear Safety and Security Manual, and Plant Access Study Guide).<br>- Actions an individual is required to take upon discovery of a fire. (Plant Access Study Guide).<br>- Individual responsibilities regarding control of transient combustibles and disposal of flammable combustible materials (Plant Access Study Guide).<br>- Examples of types of Hot Work activities requiring a permit (Plant Access Study Guide).<br>- Recognition of and response to a station alarm (Exelon Industrial/Nuclear Safety and Security Manual).<br>- Location and use of fire prevention procedures (Exelon Industrial/Nuclear Safety and Security Manual and Plant Access Study Guide) All procedures are normally located on the site's computer network.<br>- Other plant specific fire prevention activities (Exelon Industrial/Nuclear Safety and Security Manual, and the Plant Access Study Guide). | - FAQ 06-0028,rev. 002, Training Definition and Content<br>- Exelon Industrial/Nuclear Safety and Security Manual<br>- Plant Access Study Guide<br>- CC-AA-211<br>- IR 04090604-01 |

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| **3.3.1.1(2) Documentation** | Documented plant inspections including provisions for corrective actions for conditions where unanalyzed fire hazards are identified | Complies | Plant inspections are performed and documented in accordance with A-54.7 [documented on Attachments 1-4], O-6.1, and OP-AA-201-001. In accordance with OP-AA-201-001, the Fire Marshal is responsible for the conduct of periodic inspections and identification of corrective action for conditions where unanalyzed fire hazards are identified. | - A-54.7, Fire Protection Tour<br>-O-6.1, Equipment Operator Rounds and Log Sheets<br>- OP-AA-201-001, Fire Marshal Tours |
| **3.3.1.1(3) Administrative Controls** | 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. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 8.5], and CC-AA-102, CC-AA-209, and CC-AA-209-1001 requires a review of all station modifications for possible impact on safe shutdown and fire protection requirements. This review is performed and documented in accordance to CC-AA-102, and CC-AA-209-1001.<br><br>Review of plant maintenance is included in MA-AA-1000 [Sec. 1.0]. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-102, Design Input and Configuration Impact Screening<br>- CC-AA-209, Fire Protection Configuration Change Review<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- MA-AA-1000, Conduct of Maintenance Manual |
| **3.3.1.2 Control of Combustible Materials** | 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: | None | This is a general statement section. Please refer to the following subsections for the specific NFPA 805 subsection requirements and the compliance statement for each.<br><br>Procedures for control of general housekeeping practices and transient combustibles have been established, documented, and implemented as part of the fire protection program. These controls include, but are not limited to the elements described in sub-section 1 through 6 below. | - None |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.1.2 Control of Combustible Materials (Continued)** | | | Based on review of the fire prevention programmatic controls described in sub-sections 1 through 6 below, the NFPA 805, section 3.3.1.2 requirements are satisfied and no other additional elements were evaluated. | |
| **3.3.1.2(1) Wood** | 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. | Complies<br><br><br><br><br><br><br><br><br><br><br><br>Complies with use of Evaluation | All wood (lumber) brought into the power block is required to be treated with a fire retardant material in accordance with OP-AA-201-009. This procedure also includes an exception that does not require lumber greater than 6" x6" to be treated with fire retardant. This exception is in accordance with the exception cited for NFPA 805, Sec. 3.3.1.2(1).<br><br>CR-2013-001507 identified plywood in the SH used to mount electrical equipment. The corrective action process will address the issue identified.<br><br>TSR-93-089 performed a technical evaluation regarding the wood spacers used in containment, identified in the NRC April 1993 NRC inspection, for cable penetration CVPCE 21 and CVPCE 24 located in fire zone RC-2. The conclusion of the evaluation was the wood does not create a potential for affecting safety related or safety significant components under normal or accident conditions because the additional fire loading is negligible and wood is a natural insulator which will help to keep the cables from shorting therefore reducing the fire potential. The bases for previous approval remain valid.<br><br>In the event that any other untreated wood is discovered within the Power Block, due to original | - OP-AA-201-009, Control of Transients<br>-CR-2013-001507, Several Electrical panels are mounted to plywood in the SH<br>-TSR-93-089, rev. 0, Containment Wood Spacer |

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| | | | construction issues or otherwise, the issue will be tracked and evaluated within the Corrective Action Program. | |
| **3.3.1.2(2) Plastic** | 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. | Complies | Plastic sheeting material is required to be of the fire retardant type in accordance with OP-AA-201-009 which states, "Plastic films and fabrics that are USED as sheeting material for protective floor coatings, contamination control, temporary enclosures, etc.,shall be of material that is UL listed as weather resistant and flame-retardant type or MEET the flame-retardant requirements of NFPA 701, or equivalent requirements”." | -OP-AA-201-009, Control of Transients |
| **3.3.1.2(3) Waste** | 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. | Complies | Storage and removal of waste, debris, scrap, packing materials, or other combustibles is controlled in accordance with OP-AA-201-009. This procedure states, “REMOVE all waste (e.g. debris, scraps, used rags, loose packing material, oil spills) resulting from the work activity from the area immediately following completion of the activity, or at the end of each work shift, which ever comes first, or PLACE in appropriate containers (i.e., storage cabinet, trash receptacles, etc.).<br><br>MA-AA-716-026 controls the station housekeeping/material condition program, and MA-AA-1000 controls the conduct of maintenance which includes housekeeping. | - OP-AA-201-009, Control of Transients<br>- MA-AA-716-026, Station Housekeeping-Material Condition Report<br>- MA-AA-1000, Conduct of Maintenance Manual |

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| **3.3.1.2(4) Designation of Storage Areas** | Combustible storage or staging areas shall be designated, and limits shall be established on the types and quantities of stored materials. | Complies | Combustible storage or staging areas and established limits on types and quantities of stored materials are controlled by OP-AA-201-009.<br><br>The process and list of restrictions for transient combustible materials is outlined in OP-AA-201-009. | - OP-AA-201-009, Control of Transients |
| **3.3.1.2(5) Flammable and Combustible Liquids** | 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. | Complies | The controls on the use and storage of flammable and combustible liquids invoked by CC-AA-209-1001 and OP-AA-201-009 are in accordance with NFPA 30. No other NFPA standards were determined to be applicable based on guidance in NEI 04-02 (FAQ 06-0020 Rev. 1). | - NEI 04-02,rev. 2, Industry Guideline<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration<br>- OP-AA-201-009, Control of Transients |
| **3.3.1.2(6) Flammable Gases** | Controls on use and storage of flammable gases shall be in accordance with applicable NFPA standards. | Complies | The controls on the use and storage of flammable gases are invoked by CC-AA-209-1001, OP-AA-201-009, and SA-AA-122. Specific examples include:<br><br>Storage of flammable gases within any plant structure with the exception of designated storage areas is prohibited.<br><br>Bulk storage of flammable gases in designated outdoor locations are a minimum of 50 feet from plant buildings, structures, and equipment with the exception of the Primary and Secondary Storage Buildings which are evaluated within NFPA 50A Code Review (ref. DA-ME-2002-005).<br><br>Requirements are imposed on storage cylinder use, location, orientation, etc. are also included within CC-AA-209-1001. | - DA-ME-2002-005,rev. 0, Primary and Secondary Hydrogen Storage Buildings NFPA 50A Code Review.<br>- NEI 04-02,rev. 2, Industry Guideline<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration<br>- OP-AA-201-009, Control of Transients<br>- SA-AA-122, Handling and Storage of Compressed Gas Cylinders/Portable Tanks and Cryogenic Contrainers/Dewars |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| | | | No other NFPA standards were determined to be applicable based on guidance in NEI 04-02 (FAQ 06-0020). | |
| **3.3.1.3.1 Hot Work Safety Procedure** | 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. | Complies | The controls on hot work invoked by OP-AA-201-004 are in accordance with NFPA 51B. Fire Protection Program procedures are reviewed and updated as necessary as part of internal self-assessments per PI-AA-126-1001.<br><br>Compliance with NFPA 241 is addressed by compliance with NFPA 51B. Specifically, section 5.1.1 of NFPA 241-2000 (as referenced by NFPA 805-2001) states with respect to hot work, "Responsibility for hot work operations and fire prevention precautions, including permits and fire watches, shall be in accordance with NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work."<br><br>The requirements invoked by NFPA 51B - 2009, “Standard for Fire Protection During Welding, Cutting and Other Hot Work” are satisfied by OP-AA-201-004, “Fire Prevention for Hot Work”. The intent of the requirements invoked by NFPA 241, “Standard for Safeguarding Construction, Alteration, and Demolition Operations” are satisfied by procedures governing the plant modification processes, which include control of combustible materials and ignition sources, use of fire retardant lumber, use of fire watches, fire protection plant tours, etc. These procedures consist of OP-AA-201-009, A-102.12 [Sec. 3.0], A-54.7, OP-AA-201-001, and CC-AA-102. | - A-102.12, Fire Watch Training<br>- A-54.7, Fire Protection Tour<br>- OP-AA-201-001, Fire Marshal Tours<br>- PI-AA-126-1001, Focused Area Self-Assessments<br>- OP-AA-201-009, Control of Transients<br>- OP-AA-201-004, Fire Prevention for Hot Work<br>- CC-AA-102, Design Input and Configuration Change Impact Screening |

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| **3.3.1.3.2**<br>**Smoking** | Smoking and other possible sources of ignition shall be restricted to properly designated and supervised safe areas of the plant. | Complies | Smoking and other possible sources of ignition are restricted to properly designated and supervised safe areas of the plant as follows:<br><br>Smoking – [OP-AA-201-001, A-54.7]<br>Hot Work – [OP-AA-201-004]<br>Other (e.g., open flames) – [OP-AA-201-004] | - A-54.7, Fire Protection Tour<br>- OP-AA-201-001, Fire Marshal Tours<br>- OP-AA-201-004, Fire Prevention for Hot Work |
| **3.3.1.3.3**<br>**Open Flame** | Open flames or combustion-generated smoke shall not be permitted for leak or air flow testing. | Complies | Provisions are in place via OP-AA-201-006 that prohibit open flames or combustion-generated smoke for leak or air flow testing. | - OP-AA-201-006, Control of Temporary Heat Sources |
| **3.3.1.3.4**<br>**Portable Heaters** | 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. | Submit for NRC Approval | Provisions are also in place within OP-AA-201-006 to control the use of portable fuel (liquid) fired heaters in the plant. The procedure specifically states, "Fuel consuming portable 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."<br><br>Procedure OP-AA-201-004 outlines the authorization and use of the Hot Work Permit which includes controls the use of portable electric heaters and portable space heaters (combustion type) within the power block.<br><br>An exception to this requirement includes the combustion type space heaters used in the Screenhouse.<br><br>The NRC approved this request (ML15271A101) | - OP-AA-201-004, Fire Prevention for Hot Work<br>- OP-AA-201-006, Control of Temporary Heat Sources<br>- NFPA 805 LAR NRC Safety Evaluation (ML15271A101) |
| **3.3.2**<br>**Structural** | 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. | Complies with Clarification | Clarification: Power block structures are constructed of noncombustible materials. The UFSAR [Sec. 9.5.1.1.1] and the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 3.0] state that the Ginna Fire | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| **3.3.2 Structural (Continued)** | | | Protection Program must comply with GDC 3, which requires use of noncombustible and fire resistant materials throughout the facility wherever necessary to preclude fire risk. With respect to this criterion, fire prevention in all areas of the plant was provided by structure and component design which optimized the containment of combustible materials and maintained exposed combustible materials below their ignition temperature in the design atmosphere.<br><br>Additionally, use of noncombustible materials, as defined by NFPA 220 - 2012, for walls, floors, and components of power block structures that are required to maintain structural integrity, and construction is administratively controlled by CC-AA-209-1001. | - CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- Ginna UFSAR, Rev. 25 |
| **3.3.3 Interior Finishes** | 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. | Complies | Interior finish materials are controlled to meet the cited NFPA 101 - 2009 criteria for Class A materials, by use of GC- 76.11 [sections 2.2.4 and 3.6]. This procedure ensures that within the power block, nuclear grade paint is used for concrete/block floor, ceiling, or wall applications (Carboline 890/890 N or equal). This is a Class A material which uses the ASTM E84 testing standard as specified in 10.3.1 and complies with the NFPA 101 section 10.3.2.1 flame spread index of 0-25 and smoke developed index of 0-450 (reference ECP-11-000067). The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>Use of combustible materials is also administratively controlled by OP-AA-201-009. CC-AA-209-1001 includes the requirement that installation of carpet shall be in accordance with NFPA 101 requirements for | - NEIL Loss Control Manual, 2018 NEIL Loss Control Manual<br>- NFPA 101 - 2009 Edition, Life Safety Code<br>- ECP-11-000067,rev. 0, Equivalent Change Technical Evaluation of the flame spread and smoke generation values within ECP-2008-0058 Rev. 0<br>- GC-76.11, Painting Application and Inspection<br>- OP-AA-201-009, Control of Transient<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection |

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| **3.3.3 Interior Finishes (Continued)** | | | Class I interior floor finishes. Specifically that the interior floor finishes shall have a critical radiant flux of not less than 0.45 W/cm2. This is consistent with Ginna's current practices following the NEIL (Nuclear Electric Insurance Limited) Loss Control Manual [Chapter 3, Section 3.2.10]. | Program Configuration Review |
| **3.3.4 Insulation Materials** | Thermal insulation materials, radiation shielding materials, ventilation duct materials, and soundproofing materials shall be noncombustible or limited combustible. | Complies | UFSAR [Sec. 9.5.1.1.1] and the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 3.0] state that the Ginna Fire Protection Program must comply with GDC 3, which requires use of noncombustible and fire resistant materials throughout the facility wherever necessary to preclude fire risk.<br><br>Existing thermal insulation materials, radiation shielding materials, ventilation duct materials, and sound proofing materials satisfy the GDC 3 requirement to the extent practicable which meets the intent of NFPA 805, Sec. 3.3.4. Use of these materials in the plant is administratively controlled CC-AA-209-1001 and CC-AA-102. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- CC-AA-102, Design Input and Configuration Change Impact Screening<br>- Ginna UFSAR, Rev. 25 |
| **3.3.5.1 Suspended Wiring** | 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. | Submit for NRC Approval | Ginna has wiring above suspended ceilings that may not comply with the requirements of this code section. Suspended ceilings were identified in the following areas:<br><br>▪ TSC (Technical Support Center) and adjoining hallway | - CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- NFPA 805 LAR NRC Safety Evaluation (ML15271A101_ |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.5.1 Suspended Wiring (Continued)** | | | ▪ Service Building Basement office areas<br>▪ Control Room<br><br>See Attachment L of the Transition report for further details on the request for NRC approval for existing wiring above suspended ceilings.<br>The NRC approved this request (ML15271A101)<br><br>The wiring above suspended ceilings for future installations is controlled administratively within CC-AA-209-1001. | |
| **3.3.5.2 Electrical Raceways** | 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. | Complies | Noncombustible materials are used in the construction of cable trays.<br><br>CC-AA-209-1001 states, "Only metal tray and metal conduits for electrical raceways 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."<br><br>Additionally, as described in NEI 04-02 [FAQ 06-0021], where used, cable air drops of limited length (approx. 3 feet) are acceptable. | - FAQ 06-0021,rev. 2, Frequently Asked Question<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review- NEI 04-02,rev. 2, Industry Guideline |
| **3.3.5.3 Electrical Cable Construction** | Electric cable construction shall comply with a flame propagation test as acceptable to the AHJ. | Complies via Previous Approval | The UFSAR [Sec. 9.5.1.2.4.8] states, "The cable insulation used at Ginna includes Kerite, oil-based rubber, neoprene, and polyvinyl chloride (PVC). The cables have, as a minimum, passed the ASTM and UL horizontal and vertical flame tests. Power cables and PVC control cables have passed the Consolidated Edison Bonfire Test. The majority of electrical cables were purchased and installed prior to issuance of IEEE 383; however, the potential combustion products for | - RG003006, Safety Evaluation Report Supplement 2, 2/6/81<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- CC-AA-102, Design Input and Configuration Impact Screening |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.5.3 Electrical Cable Construction (Continued)** | | Submit for NRC Approval | the materials used at the station have been evaluated from generic test reports and do not exhibit an unusual or significantly hazardous nature. All cables used for modifications meet IEEE 383 criteria unless specifically excepted." A specific determination is made whenever it is impracticable to meet IEEE 383 criteria for cables used in modifications. RG003006 [Encl. 1, Item 3.2.4, pg. 2] states, "SER Section 3.2.4 indicates that the licensee is investigating the fire characteristics, including fire resistance, of the cable insulation used in the plant. By letter dated April 30, 1979, the licensee provided a list of cable insulation types and quantities used in the plant. The assumptions on Page I-1 of the licensee's study performed in response to SER Section 3.2.1 obviate the need for a separate staff analysis of the fire characteristics of electrical cable insulation. We conclude that this item is acceptable."<br><br>The approval request is for the video/communication/data cables that do not comply with the requirement of NFPA 805, section 3.3.5.3.<br><br>See Attachment L of the Transition report for further details on the request for NRC approval for the video/communication/data cables that do not comply with this requirement.<br><br>The NRC approved this request (ML15271A101)<br><br>Procedure CC-AA-209-1001 and CC-AA-102 ensures that all new power, control or instrument cable installed will be constructed to meet or exceed the requirements of: | - Ginna UFSAR,<br>- EPM-FPPR ANL Fire Protection Program Report (FPPR)<br>- NFPA805 LAR NRC Safety Evaluation (ML15271A101) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.5.3 Electrical Cable Construction (Continued)** | | | IEEE 383-1974 or<br><br>IEEE 1202-1991 or<br><br>CSA (Canadian Standards Association) 22.2 No. 0.3 or<br><br>NFPA 262 or<br><br>UL 44, UL 83, UL 1581, UL 1666, or UL 1685 | |
| **3.3.6 Roofs** | Metal roof deck construction shall be designed and installed so the roofing system will not sustain a self-propagating fire on the underside of the deck when the deck is heated by a fire inside the building. Roof coverings shall be Class A as determined by tests described in NFPA 256, Standard Methods of Fire Tests of Roof Coverings. | Complies via Previous Approval<br><br>Complies with use of Evaluation | For the Fire Protection Evaluation documented via RG010540 [Sec. 5.0, Guideline D.1.e, pg. 5-23], the response to BTP APCSB 9.5-1, Appendix A, Guideline D.1.e stated, "All metal roofs were specified to be FM Class I except the Screen House. The FHA describes the roof construction for this area and outlines fire protection requirements."<br><br>As part of the NFPA 805 transition process, Design Analysis DA-ME-08-013 was issued to document the acceptability of the Screen House roof assembly. Based on the low combustible loading inside the Screen House and the passive and active fire suppression features to mitigate a fire, the lack of a Class A roof was evaluated in the design analysis as being acceptable. As stated in the analysis, "There are robust fire mitigating design features within the Screen House which include: curbing around the diesel fire pump and oil storage tank, a drainage system within the curbed area, an automatic deluge sprinkler system S17 and smoke detectors installed over the cable trays in the SH basement, an automatic wet-pipe suppression system S18 and detection system Z26 installed above the fire pumps and service water pumps in the SH Operating | - RG010540, RG&E Fire Protection Evaluation, 2/24/77<br>- DA-ME-08-013,rev. 0, Evaluation of Screen House Roof Assembly<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.6 Roofs (Continued)** | | | floor, inside and outside hose reel coverage, and a large overhead door located in the south wall and roof exhaust fans to be used for potential smoke removal." The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>For new construction CC-AA-209-1001 is the administrative control to utilize Class A roof coverings as determined by tests described in NFPA 256 - 2003. | |
| **3.3.7 Bulk Flammable Gas Storage** | 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. | Complies with use of Evaluation | Provisions are in place via CC-AA-209-1001 that prohibit bulk storage of compressed or cryogenic flammable gas within structures housing systems, equipment, or components important to safety. With the exception of the Primary and Secondary Hydrogen Storage Buildings, SA-AA-122 requires that bulk compressed or cryogenic flammable gas be stored outdoors, a minimum of 50 feet away from buildings, structures, and equipment.<br><br>The Primary and Secondary Hydrogen Storage Buildings, which are designated storage areas, are separated from adjacent plant structures by 3-hour rated fire barriers such that a fire or explosion will not adversely impact systems, equipment, or components important to nuclear safety. Assessment of the Hydrogen Storage Buildings with the applicable requirements of NFPA 50A has been documented via DA-ME-2002-005. The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>In addition, within the Turbine Building:<br>The gas bottle racks are anchored to the concrete pedestal in the air ejector area located in the Turbine Building Mezzanine, and are also located greater than | - DA-ME-2002-005,rev. 0, Primary and Secondary Hydrogen Storage Buildings NFPA 50A Code Review.<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- SA-AA-122, Handling and Storage of Compressed Gas Cylinders/Portable Tanks and Cryogenic Containers/Dewars |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.7 Bulk Flammable Gas Storage (Continued)** | | | 5' away from the rack located in the Turbine Building Basement near the elevator. The racks are not located in the vicinity of any safety related equipment. The racks are located in a non-seismic building with no seismic category 1 or SR equipment; therefore, the rack is not required to meet seismic criteria. Signs are also provided to ensure total hydrogen content less than 400 scf. | |
| **3.3.7.1 Storage of Flammable Gas** | 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. | Complies with use of Evaluation | Storage of flammable gases is administratively controlled by SA-AA-122 and CC-AA-209-1001. Flammable gas storage is located in separate or detached buildings such that a fire or explosion will not adversely impact systems, equipment, or components important to safety.<br><br>NFPA 50A - 1973/1978 requirements are followed for Ginna's Primary and Secondary H2 Storage Buildings and compliance has been assessed [DA-ME-2002-005]. The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>Flammable gas storage in fire areas TB-1 and TB-2 is such that the total content is less than 400 scf. Flammabe gas storage is controlled administratively per SA-AA-122 and CC-AA-209-1001. NFPA 50A currently is withdrawn and incorporated into NFPA 55. NFPA 55-2010 section 10.1.1 states, "This chapter shall not apply to individual systems using containers having a total hydrogen content of less than 400 scf if each system is separated by a distance not less than 5 ft.". | - DA-ME-2002-005,rev. 0, Primary and Secondary Hydrogen Storage Buildings NFPA 50A Code Review.<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- SA-AA-122, Handling and Storage of Compressed Gas Cylinders/Portable Tanks and Cryogenic Containers/Dewars |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.7.2 Outdoor HP Flammable Gas Storage** | Outdoor high-pressure flammable gas storage containers shall be located so that the long axis is not pointed at buildings. | Complies | Outdoor high-pressure flammable gas storage is administratively controlled by SA-AA-122 and CC-AA-209-1001 such that the long axis is not pointed at buildings. | - CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- SA-AA-122, Handling and Storage of Compressed Gas Cylinders/Portable Tanks and Cryogenic Containers/Dewars |
| **3.3.7.3 Flammable Gas Storage Cylinders** | Flammable gas storage cylinders not required for normal operation shall be isolated from the system. | Complies | The storage of flammable gases, including the requirement that gas cylinders not required for normal operation shall be isolated from the system, is administratively controlled by SA-AA-122 and CC-AA-209-1001. | - CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- SA-AA-122, Handling and Storage of Compressed Gas Cylinders/Portable Tanks and Cryogenic Containers/Dewars |
| **3.3.8 Bulk Storage of Flammable & Combustible Liquids** | 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. | Complies with use of Evaluation | Provisions are in place within CC-AA-209-1001 and OP-AA-201-009 that prohibit bulk storage of flammable or combustible liquids within structures housing systems, equipment, or components important to safety. OP-AA-201-009 invokes NFPA 30 requirements and compliance with NFPA 30-2000, Flammable and Combustible Liquids Code, that has been assessed and documented by EIR 51-9159545. The credited bases for acceptance are valid and meet applicable quality requirements. | - EIR 51-9159545,rev. 000, RE Ginna Nuclear Station Code Compliance Evaluation for NFPA 30, Flammable and Combustible Liquids Code, 2000 Edition<br>- CC-AA-209-1001, Guidelines for Performing Fire Protection Program Configuration Review<br>- OP-AA-201-009, Control of Transients |
| **3.3.9 Transformers** | Where provided, transformer oil collection basins and drain paths shall be periodically inspected to ensure that they are free of debris and capable of performing their design function. | Complies | The piping between the transformer yard to the retention pond is periodically inspected by Rep Task P600016 (5 year frequency). This rep task checks the | - P600016, Rep Task<br>- P301845, Rep Task |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.9 Transformers (Continued)** | | | piping internally for blockage and unblocks/repairs as necessary.<br>The retention pond is also drained and cleaned by procedure T-6.16 and Rep Task P301845. These rep tasks ensures the design function of the transformer yard drainage system. | - T-6.16, Draining of the Transformer Yard Storm Drain Retention Pond |
| **3.3.10 Hot Pipes and Surfaces** | 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. | Complies | The administrative controls to require the prompt cleanup of oil on insulation is included within OP-AA-201-001 which checks that no environmental hazards (e.g. uncontrolled leaks) are present. Where oil leaks exist, the oil is <u>NOT</u> on hot surfaces or fibrous insulation.<br><br>Additionally, Fire Protection Tour procedure A-54.7, includes the inspection of combustible liquids including lubricating oils in contact with insulation or the surface of piping.<br><br>Deficiencies identified during plant tours in accordance with A-54.7 and OP-AA-201-001 are entered into the corrective action program, which ensures a review for prompt actions as required. | - A-54.7, Fire Protection Tour<br>- OP-AA-201-001, Fire Marshal Tours<br>- MA-AA-716-026 |
| **3.3.11 Electrical Equipment** | Adequate clearance, free of combustible material, shall be maintained around energized electrical equipment. | Complies | As defined by NEI 04-02 [FAQ 06-0024], the term "adequate clearance, free of combustible material, shall be maintained around electrical equipment" is the clear space around equipment provided to ensure an acceptable level of fire prevention for Structures, Systems, or Components (SSCs) necessary to ensure the Nuclear Safety Performance Criteria. This clear space or distance is maintained such that combustible material does not reside in an area where transient fuel packages have been shown to adversely affect "energized electrical equipment" needed to meet the | - OP-AA-201-009, Control of Transients |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.11 Electrical Equipment (Continued)** | | | nuclear safety performance criteria for the fire zone/ area, either as an ignition source or target set.<br><br>OP-AA-201-009 establishes Combustible Control Zones for all plant areas where electrical equipment relied upon to achieve the Nuclear Safety Performance Criteria could be subjected to a credible transient combustible fire exposure hazard.<br><br>Additionally, OP-AA-201-009 does not allow transient combustible material to be staged or stored such that material is within (3) feet of live electrical components.<br><br>This established the adequate clearance, free of combustible material around energized electrical equipment. | |
| **3.3.12 Reactor Coolant Pumps** | 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. | None | This is a general statement section. Please refer to the following subsections for the specific NFPA 805 subsection requirements and the compliance statement for each.<br><br>The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II, Sec. [10.2.17] states, "The RCP motor oil collection system consists of a package of splash guards, drip pans, and enclosures assembled as attachments to the reactor coolant pump motor at strategic locations to preclude the possibility of oil making contact with hot reactor coolant system components and piping. Any leaking oil is drained from each individual pump to its own collection tank, which is capable of handling the entire oil inventory of the motor. Strainers are placed at the drain of each drip pan or enclosure. The oil collection components are | - ESM-97-009,rev. 0, Effectiveness Review of RCP Motor Lube Oil Spillage Collection System<br><br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.12 Reactor Coolant Pumps (Continued)** | | | designed and attached to preclude dislodging during a seismic event." The effectiveness of the lube oil system is documented in 'Effectiveness Review of RCP Motor Lube Oil Spillage Collection System', evaluation number ESM-97-009. The review was performed to ensure that the requirements of NRC Information Notice 94-58 and NRC Inspection Procedure 64100, Requirement 02.04, are met. The evaluation concluded that the system is adequately designed to contain the lube oil spills from the various leak sites located on the RCP motors and that the lube oil collection system piping, pipe supports, and collection tank supports are designed to maintain structural integrity during a seismic event without loss of operability of safety-related equipment.<br><br>The oil collection system is designed and installed such that leakage from the oil system is safely contained for normal and off normal conditions. | |
| **3.3.12(1) Reactor Coolant Pumps** | (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. | Submit for NRC Approval | ESM-97-009 [Sec. 5.0] states, "The RCP motor lube oil spillage collection system is designed to collect leaks, drips, spills, and sprays from all potential leakage site located on the RCP motor. The following leakage sites have been identified as the potential pressurized and unpressurized leakage sites.<br>Lower bearing shaft drip pan enclosure - 4 unpressurized collection sites<br>Lower bearing level control switch enclosure - 1 unpressurized collection site Upper bearing oil cooler enclosure - 1 pressurized collection site<br>Upper bearing oil drain valve - 1 unpressurized collection site<br>Upper bearing RTD - 1 unpressurized collection site | - ESM-97-009,rev. 0, Effectiveness Review of RCP Motor Lube Oil Spillage Collection System<br>- M-97-001,rev. 0, RCP Motor Lube Oil Collection System Oil Inventory and Flow Calculations<br>- NFPA805 LAR NRC Safety Evaluation (ML15271A101) |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.3.12(1) Reactor Coolant Pumps (Continued)** | | | Upper bearing level control switch - 1 unpressurized collection site<br>Upper bearing oil lift system - 1 pressurized collection site<br>Upper bearing oil discharge pan - 1 unpressurized collection site"<br><br>The oil collection system complies with the NFPA 805 section 3.3.12 (1) requirements regarding the above leakage sites.<br><br>See Attachment L for NRC approval request for the potential of oil misting from the reactor coolant pumps due to normal motor consumption not captured by the oil collection system.<br>The NRC approved this request (ML15271A101). | |
| **3.3.12(2) Reactor Coolant Pumps** | (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. | Complies | Any potential leakage is collected and drained to a vented collection tank sized to accommodate the system inventory (200 gallons) as detailed within ESM-97-009 and M-97-001.<br><br>ESM-97-009 [Sec. 5.0] states, "The lube oil spillage collection system is designed to contain the entire inventory of lube oil filled in each RCP motor approximately 200 gallons. All potential leak sites are connected by their independent pans, enclosures, and drain pipes to a common drain header, which finally drains into the lube oil spillage collection tank. The oil spills, drips, and leaks from the various potential leak sites are collected in a closed and vented, horizontal saddle supported tank." | - ESM-97-009,rev. 0, Effectiveness Review of RCP Motor Lube Oil Spillage Collection System<br>- M-97-001,rev. 0, RCP Motor Lube Oil Collection System Oil Inventory and Flow Calculations |

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| **3.3.12(3) Reactor Coolant Pumps** | (3) A flame arrestor is required in the vent if the flash point characteristics of the oil present the hazard of a fire flashback. | Complies | "Each tank is provided with a 3 inch vent and flame arrestor, which will prevent hazard due to any fire flashback", as described within ESM-97-009 [Sec. 5.0]. | - ESM-97-009,rev. 0, Effectiveness Review of RCP Motor Lube Oil Spillage Collection System |
| **3.3.12(4) Reactor Coolant Pumps** | (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. | Complies | As detailed within ESM-97-009 [Sec. 5.0], the RCP motor lube oil spillage collection system is designed to collect leaks, drips, spills, and sprays from all potential leakage sited located on the RCP motor including:<br>Lower bearing shaft drip pan enclosure - 4 unpressurized collection sites<br>Lower bearing level control switch enclosure - 1 unpressurized collection site Upper bearing oil cooler enclosure - 1 pressurized collection site<br>Upper bearing oil drain valve - 1 unpressurized collection site<br>Upper bearing RTD - 1 unpressurized collection site<br>Upper bearing level control switch - 1 unpressurized collection site<br>Upper bearing oil lift system - 1 pressurized collection site<br>Upper bearing oil discharge pan - 1 unpressurized collection site | - ESM-97-009,rev. 0, Effectiveness Review of RCP Motor Lube Oil Spillage Collection System |
| **3.3.12(5) Reactor Coolant Pumps** | (5) The collection basin drain line to the collection tank shall be large enough to accommodate the largest potential oil leak such that oil leakage does not overflow the basin. | Complies | ESM-97-009 [Sec. 5.0] states, "The drain lines and drain header are 2" NPT flexible hose and threaded unions". Calculation M-97-001 demonstrates that a 2" drain line is adequate to accommodate the maximum potential leak due to a postulated crack at the upper bearing cooler oil line. | - ESM-97-009,rev. 0, Effectiveness Review of RCP Motor Lube Oil Spillage Collection System<br>- M-97-001,rev. 0, RCP Motor Lube Oil Collection System Oil Inventory and Flow Calculations |

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| **3.4.1**<br>**On-Site Fire-Fighting Capability** | On-Site Fire-Fighting Capability. All of the following requirements shall apply. | None | This is a general statement section. Please refer to the following subsections for the specific NFPA 805 subsection requirements and the compliance statement for each. | - None |
| **3.4.1(a)**<br>**Brigade Availability** | 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. | Complies with use of Evaluation | (a) 1<br>CC-AA-211 describes that a Fire Brigade of at least five members is maintained onsite at all times. The Fire Brigade does not include member of the shift crew necessary for post fire safe shutdown, the Shift Technical Advisor (STA), or any personnel required for other essential functions during a fire emergency.<br><br>The fire brigade is maintained on site at all times. This excludes the two members of the minimum shift crew necessary for safe shutdown. The fire brigade composition may be less than the minimum requirements for a period of time not to exceed 2 hours to accommodate unexpected absence of fire brigade members provided immediate action is taken to restore the fire brigade to the minimum requirements. This is consistent with the Fire Protection Program Report EPM-FPPR Vol. I Part II [Sec. 7.15]<br><br>The on site Fire Brigade is appropriately staffed, trained, and equipped. Compliance of Fire Brigade operations with the applicable requirement of NFPA 600 -2000, Standard on Industrial Fire Brigades, has been assessed and documented by EIR 51-9159544. The credited bases for acceptance are valid and meet applicable quality requirements. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program<br>- EIR 51-9159544,rev. 000, RE Ginna Nuclear Station Code Compliance Evaluation for NFPA 600, Standard on Industrial Fire Brigades, 2000 Edition<br>- FAQ 06-0007,rev. 2, Chapter 3 Req'mts for Fire Brigade |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.4.1(a)<br>Brigade Availability<br>(Continued)** | | None<br><br><br><br><br><br><br><br><br><br><br>None | a (2)<br>NFPA 1500 is not applicable to Ginna per FAQ 06-0007 which states, "The NFPA standards divide fire brigades into two types, based on organization and duties: "Industrial Fire Brigades" and "Industrial Fire Departments." Practically this means that a fire fighting organization at a nuclear power plant must comply with either NFPA 600 (for an Industrial Fire Brigade) or both NFPA 1500 and NFPA 1582 (for an Industrial Fire Department")."<br><br>a (3)<br>NFPA 1582 is not applicable to Ginna per FAQ 06-0007 which states, "The NFPA standards divide fire brigades into two types, based on organization and duties: "Industrial Fire Brigades" and "Industrial Fire Departments." Practically this means that a fire fighting organization at a nuclear power plant must comply with either NFPA 600 (for an Industrial Fire Brigade) or both NFPA 1500 and NFPA 1582 (for an Industrial Fire Department")." | |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.4.1(b)**<br>**Brigade Members Availability** | 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. | Complies | The staff required for fire brigade is independent of other responsibilities during fire events as specified in CC-AA-211 and the Fire Protection Program Report (EPM-FPPR) Vol. I Part II [Sec. 7.15]. The fire brigade consists of a total of five members:<br><br>(1) Fire Brigade Captain (Equipment Operator formally known as Auxiliary Operator and Fire Brigade Trained with additional Captain Training)<br>(1) Backup Fire Brigade Captain (Equipment Operator and Fire Brigade Trained with additional Captain Training)<br>(1) Fire Brigade Member (Equipment Operator and Fire Brigade Trained)<br>(1) Fire Brigade Member (Fire Brigade Trained)<br>(1) Fire Brigade Member (Fire Brigade Trained)<br><br>This compliment excludes the two members of the shift crew necessary for safe shutdown.<br><br>The Fire Brigade Captain and control room personnel responsibilities are outlined in SC-3.4.1. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- CC-AA-211, Fire Protection Program- A-103.9, Fire Brigade Training<br>-SC-3.4.1,rev. 04000, Fire Brigade Captain and Control Room Personnel Responsibilities |
| **3.4.1(c)**<br>**Brigade Members Training** | 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. | Complies via Previous Approval | Ginna's fire protection program is consistent with existing commitments and utilizes a compliance category of "Complies by previous NRC Approval" in accordance with NFPA 805 Section 3.1. The fire brigade training is acceptable per NRC FP SER, 2/14/79, sections 3.1.31 and 6.2 [RG001680], along with the Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix A, Table A-1 [sec. B.5.b]. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- RG001680, Safety Evaluation Report Docket No. 50-244, 2/14/1979 |
| **3.4.1(d)**<br>**Notification of Fire Brigade** | The industrial fire brigade shall be notified immediately upon verification of a fire. | Complies | SC-3 states, "All fires will be reported to the Control Room. The discoverer shall immediately go to the paging system or telephone to report the type and | - SC-3, Site Contingency Plan |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| | | | location of the fire and the equipment involved. The Control Room will respond to a report of fire by sending the Fire Brigade." | |
| **3.4.1(e) Physical Requirements** | 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. | Complies | All fire brigade personnel receive an annual physical examination in accordance with the Fire Protection Program Report (EPM-FPPR) Vol. I Part II [sec. 7.22], and OP-AA-201-005 using procedure HR-AA-07-107. The fire brigade must meet all physical examination requirements of Respiratory Protection medical evaluation within HR-AA-07-107. This evaluation determines if the fire brigade member can perform strenuous activity required during manual firefighting operation, and the ability of each member to use respiratory protection equipment. | - EPM-FPPR ANL, , Fire Protection Program Report (FPPR)<br>- HR-AA-07-107, Fire Brigade Surveillance Exam<br>- OP-AA-201-005, Fire Brigade Qualification |
| **3.4.2 Pre-Fire Plans** | Current and detailed pre-fire plans shall be available to the industrial fire brigade for all areas in which a fire could jeopardize the ability to meet the performance criteria described in Section 1.5. | Complies | Current and detailed Fire Response Plans are available, and controlled, for the fire brigade in the Service Building, TSC, and Control Room per SC-3.15.15. | - SC-3.15.15, Emergency Fire Equipment Inventory and Inspection |
| **3.4.2.1 Fire Area Configuration** | 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 protecton systems and features that are present. | Complies | The Fire Protecton Program Report (EPM-FPPR) Vol. I, Part II [Sec. 9.4] and OP-AA-201-008 outline the content of the Fire Response Plans (FRPs).<br>In accordance with NFPA 805, Sec. 3.4.2.1, the information provided in the FRPs includes the fire area configuration (described in terms of the manner in which the fire areas are separed from adjacent fire areas), potential hazards in the area, major nuclear safety components, and fire proteciton systems and features that are present. | -EPM-FPPR ANLFire Protection Program Report (FPPR)<br>-FRP-0.0, Major Incident at Ginna<br>-FRP-1.0, , Containment Basement<br>-FRP-2.0, Containment Intermediate Floor<br>-FRP-3.0, Containment Operating Floor<br>-FRP-4.0, Auxiliary Building Basement |

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| **3.4.2.1 Fire Area Configuration (Continued)** | | | | -FRP-5.0, Auxiliary Building Intermediate Floor<br>-FRP-6.0, Auxiliary Building Operating Floor<br>-FRP-7.0, Intermediate Building Sub-Basement<br>-FRP-8.0, Intermediate Building Controlled Side Basement<br>-FRP-9.0, Intermediate Building Controlled Side Operating Floor<br>-FRP-10.0, Intermediate Building Controlled side Top Floor<br>-FRP-11.0, Intermediate Building Clean Side Basement<br>-FRP-12.0, Intermediate Building Main Steam Header Floor<br>-FRP-13.0, Intermediate Clean Side Fan Floor<br>-FRP-14.0, , Intermediate Building Clean Side Top Floor<br>-FRP-15.0, Cable Tunnel<br>-FRP-16.0, Air Handling Room<br>-FRP-17.0, Battery Room A<br>-FRP-18.0, Battery Room B<br>-FRP-19.0, Relay Room/Multiplexer Room/Annex Room<br>-FRP-20.0, Control Room<br>-FRP-21.0, Turbine Building Basement |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.4.2.1 Fire Area Configuration (Continued)** | | | | -FRP-22.0, Turbine Building Intermediate Floor<br>-FRP-23.0, Turbine Building Operating Floor<br>-FRP-24.0, Diesel Generator Room A and Vault<br>-FRP-25.0, Diesel Generator Room B and Vault<br>-FRP-26.0, Fire Response Plan Procedure, Oil Storage Room<br>-FRP-27.0, Secondary Hydrogen Bottle House<br>-FRP-28.0, All Volatile Treatment Room<br>-FRP-29.0, Technical Support Center<br>-FRP-30.0, Screen House Basement<br>-FRP-31.0, Screen House Operating Floor<br>-FRP-32.0, Transformer Yard<br>-FRP-33.0, Primary Nitrogen Bottle House<br>-FRP-34.0, Primary Hydrogen Bottle House<br>-FRP-35.0, Standby Auxiliary Feedwater Building<br>-FRP-36.0, Service Building Basement<br>-FRP-36.1, Service Building Main Floor<br>-FRP-37.0, Contaminated Storage Building |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.4.2.1 Fire Area Configuration (Continued)** | | | | -FRP-38.0, Nuclear Assessment Building<br>-FRP-39.0, Upper Radwaste Building<br>-FRP-42.0, Butler Building<br>-FRP-43.0, Off Loading Portal<br>-FRP-44.0, On-Site Warehouse<br>-FRP-45.0, Guardhouse<br>-FRP-47.0, Ginna Training Center (East and West)<br>-FRP-47.1, Simulator Building<br>-FRP-48.0, Station 13A Switchyard<br>-FRP-49.0, Off-Site Warehouse<br>-FRP-50.0, Off-Site Diesel Fuel Oil Storage Facility<br>-FRP-51.0, Ginna Administration Building<br>- FRP-52.0, Canister Preparation Building<br>- OP-AA-201-008, Pre-Fire Plan Manual |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.4.2.2**<br>**Review Fire Plans** | Pre-fire plans shall be reviewed and updated as necessary. | Complies | OP-AA-201-008 specifically addresses the annual review of the Fire Response Procedures. | - OP-AA-201-008, Pre-Fire Plan Manual |
| **3.4.2.3**<br>**Fire Plan Availability** | Pre-fire plans shall be available in the control room and made available to the plant industrial fire brigade. | Complies | SC-3.1.1 [Sec. 3.1.4] states, "The communicator may use the Fire Response Plan (FRP) procedures and drawings located in the Control Room to assist and support the Fire Brigade Captain."<br><br>Additionally, current and detailed Fire Response Plans are available, and controlled, for the fire brigade in the Service Building, TSC, and Control Room per SC-3.15.15. | - SC-3.1.1, Fire Alarm Response (Fire Brigade Activation)<br>- SC-3.15.15, Emergency Fire Equipment Inventory and Inspection |
| **3.4.2.4**<br>**Coordination with Other Plant Groups** | Pre-fire plans shall address coordination with other plant groups during fire emergencies. | Complies | The FRPs provide instructions for Fire Brigade coordination with<br>a) Control Room,<br>b) Security,<br>c) Radiation Protection,<br>d) Offsite Assistance | - FRP-1.0, Containment Basement<br>- FRP-2.0, Containment Intermediate Floor<br>- FRP-3.0, Containment Operating Floor<br>- FRP-4.0, Auxiliary Building Basement<br>- FRP-5.0, Auxiliary Building Intermediate Floor<br>- FRP-6.0, Auxiliary Building Operating Floor<br>- FRP-7.0, Intermediate Building Sub-Basement<br>- FRP-8.0, Intermediate Building Controlled Side Basement<br>- FRP-9.0, Intermediate Building Controlled Side Operating Floor<br>- FRP-10.0, Intermediate Building Controlled Side Top Floor |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.4.2.4 Coordination with Other Plant Groups (Continued)** | | | | - FRP-11.0, Intermediate Building Clean Side Basement<br>- FRP-12.0, Intermediate Building Main Steam Header Floor<br>- FRP-13.0, Intermediate Clean Side Fan Floor<br>- FRP-14.0, Intermediate Building Clean Side Top Floor<br>- FRP-15.0, Cable Tunnel<br>- FRP-16.0, Air Handling Room<br>- FRP-17.0, Battery Room A<br>- FRP-18.0, Battery Room B<br>- FRP-19.0, Relay Room/Multiplexer Room/Annex Room<br>- FRP-20.0, Control Room<br>- FRP-21.0, Turbine Building Basement<br>- FRP-22.0, Turbine Building Intermediate Floor<br>- FRP-23.0, Turbine Building Operating Floor<br>- FRP-24.0, Diesel Generator Room A and Vault<br>- FRP-25.0, Diesel Generator Room B and Vault<br>- FRP-26.0, Fire Response Plan Procedure, Oil Storage Room<br>- FRP-27.0, Secondary Hydrogen Bottle House<br>- FRP-28.0, All Volatile Treatment Room (AVT) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.4.2.4 Coordination with Other Plant Groups (Continued)** | | | | - FRP-29.0, Technical Support Center<br>- FRP-30.0, Screen House Basement<br>- FRP-31.0, Screen House Operating Floor<br>- FRP-32.0, Transformer Yard<br>- FRP-33.0, Primary Nitrogen Bottle House<br>- FRP-34.0, Primary Hydrogen Bottle House<br>- FRP-35.0, Standby Auxiliary Feedwater Building<br>- FRP-36.0, Service Building Basement<br>- FRP-36.1, Service Building Main Floor<br>- FRP-37.0, Contaminated Storage Building<br>- FRP-39.0, Upper Radwaste Building<br>- FRP-40.0, Smith Engineering Building<br>- FRP-41.0, Pole Barn<br>- FRP-42.0, Butler Building<br>- FRP-43.0, Off Loading Portal<br>- FRP-44.0, On-Site Warehouse<br>- FRP-45.0, Guardhouse<br>- FRP-47.0, Ginna Training Center (East and West)<br>- FRP-47.1, Simulator Building<br>- FRP-48.0, Station 13A Switchyard<br>- FRP-49.0, Off-Site Warehouse |

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| **3.4.2.4 Coordination with Other Plant Groups (Continued)** | | | | - FRP-50.0, Off-Site Diesel Fuel Oil Storage Facility<br>- FRP-51.0, Ginna Administration Building<br>- FRP-52.0, Canister Preparation Building |
| **3.4.3 Training and Drills** | Industrial fire brigade members and other plant personnel who would respond to a fire in conjunction with the brigade shall be provided with training commensurate with their emergency responsibilities. | None | This is a general statement section. Please refer to the following subsections for the specific NFPA 805 subsection requirements and the compliance statement for each. | - None |
| **3.4.3(a) Industrial Fire Brigade Training** | 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. | Complies with use of Evaluation<br><br>Complies | (a) Plant Industrial Fire Brigade Training<br>(1) Ginna complies with NFPA 600 as evaluated in reference 51-9159544.<br>NFPA 1500 is not applicable to Ginna per FAQ 06-0007 which states, "The NFPA standards divide fire brigades into two types, based on organization and duties: "Industrial Fire Brigades " and "Industrial Fire Departments." Practically this means that a fire fighting organization at a nuclear power plant must comply with either NFPA 600 (for an Industrial Fire Brigade) or both NFPA 1500 and NFPA 1582 (for an Industrial Fire Department)."<br><br>(2) Fire brigade members are given quarterly training which includes classroom training and fire drills in accordance to procedure A-103.9. Procedure A-103.9 details the content of the classroom instruction which includes the toxic characteristics of expected products of combustion, including the containment and monitoring of potentially contaminated fire suppression products, and review of radiation surveys as they affect fire fighting plans. Fire Brigade training | - FFB05C, Fires in Radiologically Controlled Areas<br>- A-103.9, Fire Brigade Training<br>- 51-9159544, RE Ginna Nuclear Station Code Compliance Evaluation for NFPA 600, Standard on Industrial Fire Brigades, 2000 Edition<br>- TQ-AA-205, Training Records |

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| **3.4.3(a) Industrial Fire Brigade Training (Continued)** | | <br><br>Complies<br><br><br>Complies | for "Fires in Radiological Controlled Areas" is included in lesson plan FFB05C.<br><br>(3) A written program [A-103.9] details the fire brigade training program.<br><br>(4) A-103.9 and TQ-AA-205 prescribes the requirements for written fire brigade training records. | |
| **3.4.3(b) Non-Industrial Fire Brigade Training** | 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. | Complies | As described by the Site Contingency Plan, SC-3, the location and severity of a fire will determine which plant personnel are involved and the need for off site assistance. The fire brigade captain evaluates the need for off site assistance within the Fire Response Procedure set (see Sec. 3.4.2.4 for a complete listing of the FRPs).<br><br>The location of the fire will determine the need for other personnel such as RP, security, or off site assistance. Since drills are conducted quarterly per A-103.9, non-fire brigade personnel, such as RP and security personnel routinely receive training as to their responsibilities, potential hazards encountered, and interfacing with the fire brigade. Finally, drills involving off site fire departments are held at least annually [OP-AA-201-003]. | - SC-3, Site Contingency Plan<br>- A-103.9, Fire Brigade Training<br>- OP-AA-201-003, Fire Drill Performance |
| **3.4.3(c) Drills** | 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 | Complies | 1) Fire drills are conducted for each shift brigade, quarterly with one drill per year held on a back shift per OP-AA-201-003 and A-103.9.<br>2) OP-AA-201-003 prescribes fire drill scenarios that FOCUS on realistic fire situations based on plant operating experience and that challenge plant operations. At least four different scenarios are used | - OP-AA-201-003, Fire Drill Performance<br>- A-103.9, Fire Brigade Training |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.4.3(c) Drills (Continued)** | 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. | | during a calendar year. Also, Attach. 1, "Sample Fire Brigade Record" form to OP-AA-201-003 includes provisions that evaluate the brigade's abilities to work as a team and react and respond to challenging conditions. These include response times of fire brigade activities, proper use of equipment, simulated inoperable fire suppression systems, and coordination with other groups (Control Room, RP, offsite fire department).<br>3) All drills are pre-planned in accordance with OP-AA-201-003, which ensures that drills are conducted for a variety of plant areas essential to plant operation and that contain significant fire hazards. Additionally, OP-AA-201-003 requires at least one drill per quarter be conducted in a risk significant area as identified in the site PRA analysis.<br>4) OP-AA-201-003 requires the Fire Marshal to maintain completed fire drill records, quarterly reviews, and end of year fire drill review for a minimum of three years. Additionally, OP-AA-201-003 assesses the ability of the fire brigade to perform as a team.<br>5) Attach. 1 to OP-AA-201-003 includes a fire brigade drill critique which is required to be completed after each drill. | |
| **3.4.4 Fire-Fighting Equipment** | Protective clothing, respiratory protective equipment, radiation monitoring equipment, personal dosimeters, and fire suppression equipment such as hoses, nozzles, fire extinguishers, and other needed equipment shall be provided for the industrial fire brigade. This equipment shall conform with the applicable NFPA standards. | Complies | The fire-fighting equipment cited and additional equipment is provided for fire brigade use and is maintained via controlled inventory in the Service Building Fire Brigade Response room per SC-3.15.15.<br><br>The Site Support Emergency Vehicle is also equipped with required equipment which is also stored and maintained in accordance with SC-3.15.15. This equipment conforms to NFPA 600 section 2-6.1 | - SC-3.15.15, Emergency Fire Equipment Inventory and Inspection<br>- 51-9159544,rev. 000, RE Ginna Nuclear Station Code Compliance Evaluation for NFPA 600, Standard on Inductrial Fire Brigades, 2000 Edition |

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| | | | standards [Engineering Information Record 51-9159544]. | |
| **3.4.5.1 Mutual Aid Agreement** | Off-site fire authorities shall be offered a plan for their interface during fires and related emergencies on site. | Complies | A written agreement with the local fire company [SC-3.0.1,] is maintained to ensure adequate support for a fire emergency. Members of the local fire company have received training in basic radiation principles, typical radiation hazards, and precautions to be taken in a fire involving radioactive materials in the plant. Per OP-AA-201-003, drills involving off site fire department personnel are conducted at least annually. | - SC-3.0.1, General Information-Major Incident<br>- OP-AA-201-003, Fire Drill Performance |
| **3.4.5.2 Site-Specific Training** | Fire fighters from the off-site fire authorities who are expected to respond to a fire at the plant shall be offered site-specific training and shall be invited to participate in a drill at least annually. | Complies | A written agreement with the local fire company [SC-3.0.1] is maintained to ensure adequate support for a fire emergency. Members of the local fire company have received training in basic radiation principles, typical radiation hazards, and precautions to be taken in a fire involving radioactive materials in the plant. Per OP-AA-201-003, drills involving off site fire department personnel are conducted at least annually. | - OP-AA-201-003, Fire Drill Performance<br>- SC-3.0.1, General Information-Major Incident |
| **3.4.5.3 Security and Radiation Protection** | Plant security and radiation protection plans shall address off-site fire authority response. | Complies | SC-3.3.1 addresses plant security and radiation protection requirements for off site fire authority response. | - SC-3.3.1, Immediate Fire Notification |
| **3.4.6 Communications** | An effective emergency communications capability shall be provided for the industrial fire brigade. | Complies | An effective emergency communications capability is provided for the industrial fire brigade as described in the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.25]. There are three communications systems within the plant. The primary system is the combination paging and party system; in addition, there is a sound powered phone system and a radio paging system. The sound powered system is hard wired with separate wires from the combination paging and party system. The radio paging system provides communication with areas inside the containment with | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| **3.4.6 Communications (Continued)** | | | the help of a radio antenna mounted in the containment. Additionally, a repeater located in the Nuclear Assessment Building and remote amplifiers and a distributed antenna system allows for greater flexibility with radio communications. | |
| **3.5.1 Adequate Reliability, Quantity & Duration** | A fire protection water supply of adequate reliability, quantity, and duration shall be provided by one of the two following methods. (a) Provide a fire protection water supply of not less than two separate 300,000-gal (1,135,500-L) supplies. (b) Calculate the fire flow rate for 2 hours. This fire flow rate shall be based on 500 gpm (1892.5 L/min) for manual hose streams plus the largest design demand of any sprinkler or fixed water spray system(s) in the power block as determined in accordance with NFPA 13, Standard for the installation of Sprinkler Systems, or NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection. The fire water supply shall be capable of delivering this design demand with the hydraulically least demanding portion of fire main loop out of service. | Complies | Complies with method (b)<br><br>The fire protection water supply is capable of delivering the design demand with the hydraulically least demanding portion of the fire main loop out of service.<br><br>The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.8] states, "The on-site fire service water [pumped from Lake Ontario] provides the supply for most of the automatic and manual water suppression systems and hose stations in the plant. The off-site supply for the fire hydrants (yard hydrants) on the yard fire main are supplied with water from the town of Ontario. The yard hydrant system can be used as a back-up to some of the fixed protection systems and inside hose stations by cross-tying both systems through wall hydrants in four locations...A dry hydrant was installed west of the Screen House for the purpose of drafting water from the discharge canal. The use of an on-site pumper truck is required to utilize this water supply."<br><br>Fire suppression systems in power block areas that utilize the off-site supply as the primary water supply are located in the Screen House, the Contaminated Storage Building, Canister Preparation Building, and Upper Radwaste Building. The off-site supply can also be used as a back-up water supply to the SAFW pumps | - DA-ME-2001-031, Evaluation of Suppression System Flow and Pressure Requirements<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.5.1 Adequate Reliability, Quantity & Duration (Continued)** | | | and the diesel generator lube-oil coolers and jacket heat exchangers via temporary hoses.<br><br>Per DA-ME-2001-031 [Sec. 7.3], the largest fixed suppression system hydraulic demand for safety-related plant areas is System S29 which is approximately 1,240 gpm. This includes a 200 gpm “inside” hose stream allowance. The remaining 300 gpm allowance for “outside" hose streams is supplied by the off-site water supply. 1240 gpm x 120 minutes = 148,800 gallons. Lake Ontario contains much greater than 148,800 gallons of water. The fire pumps are capable of delivering 1240 gpm at the system design pressure of 132 psi per DA-ME-2001-031. The credited bases for acceptance are valid and meet applicable quality requirements. | |
| **3.5.2 Water Tanks** | 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. | Complies | The fire protection water supply system complies with Exception 1 as described below:<br><br>The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.9, 10.2.24] describes, both of the two (2) fire pumps utilize water from Lake Ontario and take suction from the circulating water intake [via independent suction lines].<br><br>The pumps are physically separated from each other by 16 feet with no intervening combustibles [33013-2143].<br><br>A curb was installed around the diesel fire pump and the diesel oil storage tank to control any diesel oil leaks. The curbed area is equipped with a floor drain which drains to a holding tank buried outside the screen | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>-33013-2143, Plant Arrangement ScreenHouse |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.5.2 Water Tanks (Continued)** | | | house. An automatic sprinkler system is also provided in the area of the two fire pumps (supplied by the yard loop). Therefore, the pumps are considered adequately separated. Ref. the Fire Protection Program Report (EPM-FPPR) Vol.I Part II [Sec. 10.2.24]. | |
| **3.5.3 Fire Pumps** | Fire pumps, designed and installed in accordance with NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, shall be provided to ensure that 100 percent of the required flow rate and pressure are available assuming failure of the largest pump or pump power source. | Complies with use of Evaluation | As described by the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.9], "The [on-site] water supply is delivered by a combination of two vertical shaft centrifugal fire pumps located in the Screen House. Both pumps take suction from the circulating water intake [via independent suction lines]. One pump is diesel engine-driven and the other is electric motor-driven....Each pump has a rated output of 2,000 gpm at 125 psig minimum, which is adequate to meet the largest anticipated water demand. Design Analysis DA-ME-2001-031 documents the pump performance capabilities versus the various suppression system demands."<br><br>Compliance with NFPA 20-1983, "Standard for Centrifugal fire Pumps" has been assessed and documented via FPPR Vol. II, Appendix D [Table D-5] and the R.E. Ginna NFPA Code Compliance Assessment [Report No. 02-0950-1343]. Deviations from NFPA 20 that were evaluated as part of the code review included location of the motor-driven fire pump controller, use of 1/4" diameter pressure sensing lines, and location of pressure sensing line connections. In addition, CR 2007-000201 was issued to assess lack of a locking mechanism on the diesel engine-driven fire pump controller cabinet. It was determined that the existing cabinet configuration meets the intent of the code. | - DA-ME-93-108,rev. 1, Diesel Fire Pump Fuel Consumption Calculation<br>- DA-ME-2001-031, Evaluation of Suppression System Flow and Pressure Requirements<br>- DA-CE-95-161,rev. 2, Diesel Fire Pump Control Panel Anchorage<br>- DA-ME-95-137,rev. 0, Fire Pump Relief Valve Setpoint Change<br>- DA-ME-95-149,rev. 0, Diesel Fire Pump Fuel Oil Supply Piping<br>- PCR 2001-0038,rev. 0, Fire Pump Bowl and Shaft Assembly Upgrade<br>- IR 02-0950-1343,rev. 0, R.E.Ginna NFPA Code Compliance Assessment 7/86 Report No. 02-0950-1343<br>- CR-2007-000201,rev. 0, Diesel Fire Pump Controller Cabinet Needs to be Locked<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.3 Fire Pumps (Continued)** | | | CR-2012-006004 evaluated a deviation from the installation testing for the fire pumps as and determined the fire pumps did not meet the NFPA 20 requirements at the time of installation (achieving 65% of total rated head at not less than 150% rated capacity), however, the pumps meet the testing and maintenance requirements of NFPA 25. CA-2012-002913 and CA-2012-002914 are corrective actions to track the refurbishment of the diesel and motor driven fire pumps.<br><br>STP-O-13.1 dated 12/28/11 shows that the fire pump performance curves were compared with their respective water supply capabilities. The pumps are able to supply the required flow and head to the fire water systems.<br><br>Additional engineering evaluations associated with the acceptability of the fire pump design and arrangement are:<br><br>DA-CE-95-161<br>DA-ME-95-149<br>DA-ME-95-137<br>DA-ME-93-108<br><br>The credited bases for acceptance are valid and meet applicable quality requirements. | -CR-2012-006004,rev.0, Diesel and Motor Driven Fire Pumps do not meet NFPA 20 code requirements<br>-CA-2012-002913, Corrective Action to Refurbish diesel fire pump<br>-CA-2012-002914, Corrective Action to Refurbish motor fire pump<br>-STP-O-13.1, Annual Fire Pump Insurance Surveillance Test 12/28/11. |
| **3.5.4 Required Fire Pumps** | 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 | Complies with use of Evaluation | The Fire Protection Program Report (EPM-FPPR) Vol. I Part II [Sec. 10.2.9] states, "The [on-site] water supply is delivered by a combination of two vertical shaft centrifugal fire pumps located in the Screen | - DA-ME-2001-031, Evaluation of Suppression System Flow and Pressure Requirements |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.4 Required Fire Pumps (Continued)** | power buses capable of providing 100 percent of the required flow rate and pressure shall be provided. | | House...One pump is diesel engine-driven and the other is electric motor-driven...Each pump has a rated output of 2,000 gpm at 125 psig minimum, which is adequate to meet the largest anticipated water demand. Design Analysis DA-ME-2001-031 [Sec. 7.3] documents the pump performance capabilities versus the various suppression system demands." The credited bases for acceptance are valid and meet applicable quality requirements. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |
| **3.5.5 Pump and Driver Separation** | Each pump and its driver and controls shall be separated from the remaining fire pumps and from the rest of the plant by rated fire barriers. | Complies via Previous Approval | Summary of licensee submittal:<br>In response to a letter dated May 3, 1978 [Record RG009150] to RG&E from the NRC, a request for responses to Enclosure 1 [Robert E. Ginna Nuclear Power Plant Docket No. 50-244 Request for Additional Information] RG&E prepared responses to the NRC on June 9, 1978 regarding the questions and positions within Enclosure 1 [Record RG009126] . In response to “Curbed Areas” [Enclosure 1 item 16], RG&E’s response related to the diesel driven fire pump area to provide the results of an analysis that shows that curbed areas surrounding combustible liquid tanks have sufficient capacity to contain the full contents of the tanks plus the quantity of water required for extinguishment of a fire involving the combustible liquid was: “There are no combustible liquid tanks that are curbed in safety related areas. The drainage system is utilized to contain spills caused by leakage, overflows, or pipe rupture. The proposed curb for the diesel driven fire pump area will be sized to contain all of the diesel fuel from a full day tank. In addition, the drain will carry this fuel to a buried holding tank with sufficient capacity to contain all the diesel fuel. “<br>Summary of NRC response: | - RG001680, Safety Evaluation Report Docket No. 50-244, 2/14/1979<br>- Ginna UFSAR, -RG009150, Letter from NRC to RG&E dated May 3, 1978<br>-RG009126, Letter from RG&E dated June 9, 1978.<br>-EWR1834A Design Analysis, Fire Protection – Mechanical Package No. 3 |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.5 Pump and Driver Separation (Continued)** | | | RG001680 (Letter to RG&E from NRC dated 2/14/79) section 4.3.1.2 states, "There is no fire barrier between the two pumps [fire pumps], which are about 20 feet apart. The 275 gallon fuel storage tank for the diesel engine driven fire pump is located in the screen house approximately 10 feet from the pump. The licensee has proposed to install an automatic sprinkler system in the area which includes the two fire pump; and to provide curbs around the diesel fire pump and the oil storage tank. The curbed area will be provided with a floor drain which drains to a holding tank buried outside of the building. This protection would be adequate to prevent a fire from disabling both fire pumps."…………."We find that, subject to implementation of the above described modifications, the fire pumps will provide adequate fire water supply [only modification identified in section 4.3.1.2 was the curb around the diesel fire pump and oil storage tank]. This satisfies the objectives identified in Section 2.2 of this report and is, therefore, acceptable."<br>Modification status:<br>Curbed area and drain/tank are each capable of holding the entire contents plus an additional 10%. These were installed under EWR 1834A. The physical layout of the pumps has not changed since the previous approval and it was determined that the actual distance between the centerline to centerline of the pumps was measured to be 16 feet.<br>The bases for previous approval remain valid. | |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.6 Pump Start and Stop** | Fire pumps shall be provided with automatic start and manual stop only. | Complies with Clarification | Clarification:<br>UFSAR Sec. 9.5.1.2.3.2 and the Fire Protection Program Report (EPM-FPPR) Vol. I Part II [Sec. 10.2.9] state that both pumps start automatically on a drop in system pressure. An automatic controller is located with each fire pump. Each pump can be manually stopped at the controller. In addition, the electric-driven fire pump can also be manually stopped by opening a circuit breaker located in the screen house near the fire pumps. Both pumps can be started manually from the Auxiliary Benchboard or locally at the controllers in the Screen House. The electric fire pump trips automatically on undervoltage and SI, or can be manually tripped at the breaker in the Screen House. The diesel fire pump will trip on overspeed and requires action to reset [SC-3.16.2, VTD-C0742-5006]. The clarification is that the electric fire pump trips auto-matically on undervoltage and SI, and the diesel fire pump trips automatically on overspeed, whereas the requirement is manual stop only. Engineering Service Request, ESR-11-0421 (ECP-13-000702), as originally listed in Attachment S-2, item 18, of the LAR, has also been installed to protect the automatic start of the diesel fire pump. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- Ginna UFSAR,<br>- SC-3.16.2<br>- VTD-C0742-5006<br>- Attachment S-2, item 18<br>- ECP-13-000702, Modify the diesel fire pump control panel remote start circuit to isolate the remote start circuit from the control panel |
| **3.5.7 Individual Fire Pump** | Individual fire pump connections to the yard fire main loop shall be provided and separated with sectionalizing valves between connections. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I Part II [Sec. 10.2.9] states, "A separate 10" discharge line from each pump supplies the 8" and 10" interior loop main. All automatic and manual fixed water suppression systems and interior hose stations are supplied by this loop main. Gate valves subdivide the main into a number of sections so that a single section can be isolated without impairing the entire loop. The design is such that isolation of a section of fire water piping system does not cause a loss of both the fixed | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.7 Individual Fire Pump (Continued)** | | | suppression system protection and the manual hose coverage for the same area with the exception of the Service Building which is provided with two hose reels that are connected to the suppression system piping. Reach & Rod Post Indication Gate Valve sectional valves are provided on the off-site yard main to subdivide it so that a single section can be isolated without impairing the entire system." | |
| **3.5.8 Automatic Pressure Maintenance** | A method of automatic pressure maintenance of the fire protection water system shall be provided independent of the fire pumps. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.9] states, "A 15,000 gallon pressure tank (10,000 gallons of water) with an instrument air system interface and a 120 gpm centrifugal booster pump maintain system pressure at a minimum of 100 psig." | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |
| **3.5.9 Fire Pump Notification** | Means shall be provided to immediately notify the control room, or other suitable constantly attended location, of operation of fire pumps. | Complies | The UFSAR [Sec. 9.5.1.2.3.2] states, "Pump running, water flow, and pump power loss or engine trouble signals are annunciated in the Control Room, as well as at the individual pump controllers. The fire relay panel provides these signals for the Control Room alarms and indications and start signals to the pumps on system pressure drop and on water flow in the fixed fire suppression systems served by the pumps." The Fire System Alarm Panel alarm is included in Alarm Response procedure AR-K-31. | - AR-K-31, Fire System Alarm Panel<br>- Ginna UFSAR |
| **3.5.10 Underground Yard Fire Main Loop** | An underground yard fire main loop, designed and installed in accordance with NFPA 24, Standard for the Installation of private Fire Service Mains and Their Appurtenances, shall be installed to furnish anticipated water requirements. | Complies with use of Evaluation | Compliance with NFPA 24-1984, “Private Fire Mains and Their Appurtenances” has been assessed and documented in the Fire Protection Program Report (EPM-FPPR) Vol.II, Appendix C [Table C-6] and the R.E. Ginna NFPA Code Compliance Assessment [Report No. 02-0950-1343]. Deviations from NFPA 24 that were evaluated as part of the code review included lack of post indicator valve identification tags, construction of | - IR 02-0950-1343,rev. 0, R.E.Ginna NFPA Code Compliance Assessment 7/86 Report No. 02-0950-1343<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| | | | the hose houses, and contents of the hose houses. To resolve these deviations, the hose houses were replaced, the post indicator valves were tagged with EINs, and the equipment contents are maintained within the hose houses. The credited bases for acceptance are valid and meet applicable quality requirements. | |
| **3.5.11 Maintenance or Repair** | 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. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.9] states, "A separate 10” discharge line from each pump supplies the 8” and 10” interior loop main. All automatic and manual fixed water suppression systems and interior hose stations are supplied by this loop main. Gate valves subdivide the main into a number of sections so that a single section can be isolated without impairing the entire loop. The design is such that isolation of a section of fire water piping system does not cause a loss of both the fixed suppression system protection and the manual hose coverage for the same area with the exception of the Service Building which is provided with two hose reels that are connected to the suppression system piping. Reach & Rod Post Indication Gate Valve sectional valves are provided on the off-site yard main to subdivide it so that a single section can be isolated without impairing the entire system." | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |
| **3.5.12 Threads** | 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. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix A Table A-1, [Sec. E.2.g] states, "Threads on hydrant outlets and hose couplings are compatible with those of fire departments which serve the plant."<br><br>This is also demonstrated during the annual drills involving off site fire department personnel OP-AA-201-003. | - OP-AA-201-003, Fire Drill Performance- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.13 Headers** | Headers fed from each end shall be permitted inside buildings to supply both sprinkler and standpipe systems, provided steel piping and fittings meeting the requirements of ANSI B31.1, Code for Power Piping, are used for the headers (up to and including the first valve) supplying the sprinkler systems where such headers are part of the seismically analyzed hose standpipe system. Where provided, such headers shall be considered an extension of the yard main system. Each sprinkler and standpipe system shall be equipped with an outside screw and yoke (OS&Y) gate valve or other approved shutoff valve. | Complies with Clarification | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.9] states, "A separate 10" discharge line from each fire pump supplies the 8" and 10" interior loop main. All automatic and manual fixed water suppression systems and interior hose stations are supplied by this loop main. Outside screw and yoke gate valves subdivide the loop into a number of sections so that a single section can be isolated without impairing the entire loop. The design is such that isolation of a section of fire water piping system does not cause a loss of both the fixed suppression system protection and the manual hose coverage for the same area, with the exception of the service building. For the service building, use of manual hose lines from the exterior yard main provides backup suppression capability."<br><br>The above ground fire service water piping is fabricated of carbon steel piping and fittings [ME-318 line spec. Class 125-11] fittings meeting the requirements of ANSI B31.1 "Power Piping".<br><br>The fire service piping is classified as non-nuclear safety class with II/I supports where those portions of structures, systems, or components whose continued function is not required but whose failure could reduce the functioning of any plant feature included in items 1.a through 1.q of Regulatory Guide 1.29, to an unacceptable safety level or could result in incapacitating injury to occupants of the control room and is designed and constructed so that the SSE would not cause such failure as stated in Regulatory Guide 1.29 2.c. | - RG010540, RG&E Fire Protection Evaluation, 2/24/77<br>- ME-318, Pipe Line Specification<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.13 Headers (Continued)** | | | Additionally, the Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix A, Table A-1, [Sec. E.3.a] states, "Each sprinkler system has an OS&Y shutoff valve. Each individual hose station has a small OS&Y valve. (RG010540)".<br>Clarification:<br><br>Ginna was an operating plant when Appendix A to BTP APCSB 9.5-1 was issued in 1976. Regulatory Position E.3.d relative to the capability to supply water to at least standpipes following a SSE was not applicable to plants under construction or in operation as of July 1, 1976. | |
| **3.5.14 Periodic Inspection Program** | 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.<br>3.5.14(b) Locking valves in their normal position. Keys shall be made available only to authorized personnel.<br>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. | Complies with use of Evaluation | 3.5.14 (a) and (b)<br>The Fire Protection Program Report (EPM-FPPR), Vol. I, Part II, [Sec. 10.2.12] states, "All control valves for spray or sprinkler systems are electrically supervised with alarms in the Control Room or are locked in the proper position. Other important valves on the water supply are either electrically supervised or locked in the proper position."<br><br>To demonstrate that the fire protection water supply system is operable and thus meets the requirements of the TRM [TR 3.7.1, TR 3.7.2], a procedurally controlled periodic fire protection system supply valve inspection program is conducted.<br><br>All fire protection water supply and fire suppression system control valves are periodically tested according to STP-O-13.4.2 through STP-O-13.4.14, STP-O-13.16 | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- IR 02-0950-1343,rev. 0, R.E.Ginna NFPA Code Compliance Assessment 7/86 Report No. 02-0950-1343<br>- R. E. Ginna “Technical Requirements Manual (TRM)”<br>- STP-O-13.4.2, Multimatic Valve Testing-Suppression System S27 Turbine Oil Reservoir<br>- STP-O-13.4.3, Flood Valve Testing – Suppression System S25 H2 Seal Oil Unit Auto Deluge<br>- STP-O-13.4.4, Multimatic Valve Testing – Suppression |

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| **3.5.14 Periodic Inspection Program (Continued)** | | | through STP-O-13.4.27, and STP-O-13.4.36 through STP-O-13.4.41.<br><br>STP-O-13.17 [Sec. 6.0] implements a semi-annual functional test of all fire protection water supply valve supervisory switches to ensure that closure of the valve will initiate an alarm signal in the Control Room.<br><br>FPS-5 [Attach. 1] implements a quarterly inspection of fire protection valves in the off-site yard main flowpath. Compliance with NFPA 26-1983, "Supervision of Valves Controlling Water Supplies for Fire Protection" has been assessed and documented in the Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix D [Table D-7] and the R.E. Ginna NFPA Code Compliance Assessment [Report No. 02-0950-1343]. Deviations from NFPA 26 that were evaluated as part of the code review included lack of identification tags on some valves, lack of a documented periodic inspection process for some valves, and lack of a means for supervising some valves. To address these deviations all valves were tagged with unique EINs and procedures were revised to periodically inspect all valves. All valves controlling water supplies are supervised with the exception of four wall hydrants, valves in the diesel and motor-driven fire pump test lines, and all underground valves in the domestic water system. The facility's Technical Requirements Manual requires a periodic check of the position of those valves that are not locked, supervised, or otherwise secured in position is in the correct position per TSR 3.7.1.2. The credited bases for acceptance are valid and meet applicable quality requirements. | System S12 1A Diesel Generator Preaction System<br>- STP-O-13.4.5, Multimatic Valve Testing-Suppression System S13 1B Diesel Generator Preaction System<br>- STP-O-13.4.6, Flood Valve Testing-Suppression System S14 Turbine Driven Aux. Feedwater Pump and Turbine Lube Oil Reservoir Manual Deluge<br>- STP-O-13.4.7, Protomatic Valve Testing - Oil Storage Room Auto Deluge Zone S16<br>- STP-O-13.4.8, Deluge Valve System Testing System S20 (Main Transformer)<br>- STP-O-13.4.9, Deluge Valve System Testing - #11 Transformer Zone S21<br>- STP-O-13.4.10A, Deluge Valve System Testing - System S22 (#12-A Transformer)<br>- STP-O-13.4.10B, Deluge Valve System Testing - System S23 (#12-B Transformer)<br>- STP-O-13.4.11, Multimatic Valve Testing - Suppression System S05<br><br>Cable Tunnel Auto Deluge |

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| **3.5.14 Periodic Inspection Program (Continued)** | | | | - STP-O-13.4.12, Alarm Valve System Testing – Fire System S-26 Turbine Island Sprinkler<br>- STP-O-13.4.13, Alarm Valve System Testing - Fire System S19 - Service Building Sprinkler<br>- STP-O-13.4.14, Multimatic Auto Deluge Valve System Testing System #14 (S02) 1G Auxiliary Charcoal Filter<br>-STP-O-13.4.16, Flood Vavle Testing-Suppression System S01 Auxiliary Building Basement Pre-Action System<br>- STP-O-13.4.17, Multimatic Valve Testing-Suppression System #S03 Aux Bldg Mezz Level West Pre-Action System<br>- STP-O-13.4.18, Flood Valve Testing - Suppression System S04 Auxiliary Building Mezzanine Pre-Action System<br>- STP-O-13.4.19, Flood Valve Testing – Suppression System S06 Air Handling Room Auto Deluge<br>- STP-O-13.4.20, Flood Valve Testing-Suppression System S09 Relay Room SE Manual Deluge<br>- STP-O-13.4.21, Flood Valve Testing – Suppression System |

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| **3.5.14 Periodic Inspection Program (Continued)** | | | | S10 Relay Room West Manual Deluge<br>- STP-O-13.4.22, Flood Valve Testing – Suppression System S11 Relay Room Northeast manual deluge<br>- STP-O-13.4.23, Traveling Screen High Pressure Spray Wash Automatic Isolation Verification<br>- STP-O-13.4.24, Multimatic Valve Testing – Suppression System S17 Screenhouse Screenhouse Bsmt Auto Deluge<br>- STP-O-13.4.25, Multimatic Valve Testing – Suppression System #S15 Inter. Bldg. Bsmt Cable Trays Pre-Action System<br>- STP-O-13.4.26, Multimatic Valve Testing-Suppression System S29 Control Room Wall Auto Spray<br>- STP-O-13.4.27, Alarm Valve Testing – Suppression System #S18 Service Water Pump Sprinkler System<br>- STP-O-13.4.36, Alarm Valve Testing – Suppression System S36 Auxiliary Bldg. West Stairwell and Crane Bay Sprinkler System<br>- STP-O-13.4.37, Alarm Valve Testing – Suppression System |

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| **3.5.14 Periodic Inspection Program (Continued)** | | | | S35 Auxiliary Building East Stairwell Sprinkler System<br>- STP-O-13.4.38, Alarm Valve System Testing - Fire System S38 Turbine Building East Mezzanine Level Sprinkler (Office Areas)<br>- STP-O-13.4.39, TSC Diesel Generator Fire System Flow Check S30<br>- STP-O-13.4.40,rev. 0, TSC HVAC Charcoal Filter Deluge System S31<br>- STP-O-13.4.41, TSC HVAC Detector and Hose Reel Water Supply Zone S33<br>- STP-O-13.4.45, Alarm Valve System Testing – Fire System S45 GE Betz Auto Sprinkler Suppression System<br>- STP-O-13.4.47, Alarm Valve System Testing- Fire System S51 Canister Preparation Building Suppression System<br>- STP-O-13.4.48, DDAFW Pre-Action Suppression System Testing<br>- STP-O-13.17, Valve Tamper Switches<br>- TRM,rev. 49, Technical Requirements Manual<br>- FPS-5, Inspection, Lubrication and/or Spring Testing of PIV and Curb Valves |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.15 Hydrants** | Hydrants shall be installed approximately every 250 ft (76 m) apart on the yard main system. A hose house equipped with hose and combination nozzle and other auxiliary equipment specified in NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances, shall be provided at intervals of not more than 1000 ft (305 m) along the yard main system. Exception: Mobile means of providing hose and associated equipment, such as hose carts or trucks, shall be permitted in lieu of hose houses. Where provided, such mobile equipment shall be equivalent to the equipment supplied by three hose houses. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.10] states, "Yard hydrants are provided at approximately 250-ft intervals around the exterior of the plant. The lateral to each hydrant is controlled by a Reach Rod or Post Indicator Valve. Firefighting equipment is housed within hose houses."<br><br>SC-3.15.15 [Attach. 13 through 16] list the four (4) hose houses provided in the plant yard area and the equipment contained within each for monthly inspection purposes. The equipment stored in the hose houses is suitable for exterior use by the fire brigade. The hose houses are not more than 1000 ft along the yard main system as shown on reference 33013-2170, 33013-2171, 33013-2172, and 33013-2173. The equipment in the hose houses meet the intent of that specified by NFPA 24-1984 and is consistent with RG00160 [Sec. 3.1.26]. | - RG001680, Safety Evaluation Report Docket No. 50-244, 2/14/1979<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- 33013-2170, Plant Arrangement Yard - NW<br>- SC-3.15.15 Emergency Fire Equipment Inventory and Inspection<br>- 33013-2172, Plant Arrangement Yard - SW<br>- 33013-2173, Plant Arrangement Yard - SE<br>- 33013-2171, Plant Arrangement Yard - NE |
| **3.5.16 Water Supply** | The fire protection water supply system shall be dedicated for fire protection use only. Exception No. 1 : Fire protection water supply systems shall be permitted to be used to provide backup to nuclear safety systems, provided the fire protection water supply systems are designed and maintained to deliver the combined fire and nuclear safety flow demands for the duration specified by the applicable analysis. Exception No. 2: Fire protection water storage can be provided by plant systems serving other functions, provided the storage has a dedicated capacity capable of providing the maximum fire protection demand for the specified duration as determined in this section. | Complies with use of Evaluation | Complies with use of Evaluation<br>The UFSAR [Sec. 9.5.1.2.3.5] states, “The [offsite] yard loop supplies water to the yard hydrants and as a partial backup to the water suppression systems inside the plant. The yard loop provides a backup source of cooling water if service water (SW) is lost. It provides a backup to the condensate storage tanks for feedwater to the motor-driven (MDAFW) or turbine-driven auxiliary feedwater (TDAFW) pumps. It provides a backup to the condensate test tank for feedwater to the standby auxiliary feedwater pumps (SAFW). It can be used to provide cooling water to the emergency diesel generators. It provides an alternative source of cooling to the component cooling water (CCW) heat exchangers (under emergency, beyond design basis | - DA-ME-2000-040, City Water Yard Loop X-Tie to Fire Yard Loop Hydraulic Calculation<br>- DA-ME-2000-001, City Yard Loop Capability to Supply Cooling Water to EDG, SAFW and Flight Screen House Fire with a Loss of Service Water<br>- PCR-99-090,rev. 1, Fire Protection System and HPSW System Intertie<br>- Ginna UFSAR<br>- NFPA 805 LAR NRC Safety Evaluation (ML15271A101) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.16 Water Supply (Continued)** | | | conditions only). The yard loop is equipped with manual isolation gate valves to provide segment isolation in the case of line failures. The yard loop is supplied water from the town of Ontario water system."<br>DA-ME-2000-001 and DA-ME-2000-040 describe the acceptability of the yard loop to supply water for the secondary uses described above, via plant operator actions using temporary hose connections. The credited bases for acceptance are valid and meet applicable quality requirements. | |
| | | Submit for NRC Approval | Submit for NRC Approval<br>PCR-99-090 modified the fire suppression water system to furnish high pressure water to the traveling screen spray wash system. Specifically, the UFSAR [Sec. 9.5.1.2.3.3] states, "When not required for fire suppression, the electric motor-driven fire pump can be aligned to supply water to the traveling screen wash header at a pressure higher than service water pressure. The purpose of this spray wash system is to remove debris from the traveling screens when high debris conditions exist. The high pressure spray wash (HPSW) system is manually operated, and encompasses piping, two manual gate valves, an automatic isolation valve and a check valve which cross-connects between the fire suppression system test line and the main traveling screen wash header supply line downstream of the safety-related service water non-essential load isolation motor-operated valves. Since the electric motor-driven fire pump secondary function is to supply the high pressure spray wash system only when plant conditions warrant its use, upon any automatic actuation of the electric motor-driven fire pump via a | |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.5.16 Water Supply (Continued)** | | | fire suppression system demand, the high pressure spray wash system will automatically be isolated such that the primary function of supplying the fire suppression system can be satisfied."<br><br>As described above, use of the electric-driven fire pump to supply the HPSW application will automatically be secured in the event that the electric fire pump is required for fire suppression purposes. Therefore, the fire protection water supply system design meets the intent of Exception No. 1 to NFPA 805, Section 3.5.16. However, during the NFPA 805 transition process, no prior NRC approval of use of the fire protection water supply for HPSW system applications was identified. Therefore, NRC approval of this non-fire protection use of the fire protection water supply system is requested.<br><br>See Attachment L of the Transition Report for further details on the request for NRC approval for the use of the fire protection water system to supply the high pressure spray wash system.<br>The NRC approved this request (ML15271A101). | |
| **3.6.1 Standpipe and Hose Systems** | For all power block buildings, Class III standpipe and hose systems shall be installed in accordance with NFPA 14, "Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems". | Complies with use of Evaluation | For all power block building, Class III standpipe and hose systems compliance with NFPA 14-1983 has been assessed and documented in the Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix C [Table C-3] and the R.E. Ginna NFPA Code Compliance Assessment [Report No.02-0950-1343]. Deviations from NFPA 14 that were evaluated as part of the code review included lack of listed fire hose at some hose stations and lack of pressure gauges at the top of some standpipe system risers. To address these deviations, all fire hose stations were equipped with 100 ft of UL or | - DA-ME-92-145, Controlled Intermediate Building Sub-Basement Fire Protection Systems Evaluation<br>- RG001680, Safety Evaluation Report Docket No. 50-244, 2/14/1979<br>- DA-ME-94-004, Hose Reels<br>- IR 02-0950-1343,rev. 0, R.E.Ginna NFPA Code |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.6.1 Standpipe and Hose Systems (Continued)** | | | ULC approved municipal fire hose [UFSAR Sec. 9.5.1.2.3.6, and EPM-FPPR Vol. I, Part II Sec. 10.2.11]. Pressure gauges are located at the top of standpipes greater than 60 ft high [EPM-FPPR Vol II, Appendix C Table C-3].<br><br>DA-ME-94-004 documents that effective hose stream coverage throughout the plant can be achieved, but in some instances hose streams supplied by exterior yard hydrants is needed to supplement interior hose station coverage. Hose stretch tests have also been performed to address the commitment identified in RG001680 [Sec. 3.1.36].<br><br>DA-ME-92-140 provides a hydraulic analysis of hose stations inside Containment. The residual pressure at the outlet of hose station valves in Containment exceeds 100 psi, but this is necessary to overcome hose pressure losses and maintain effective nozzle pressure. Additionally, nozzle flow rates at Containment hose reels do not meet a 100 gpm flow rate, but the flow rates (80 gpm minimum) are sufficient for service inside Containment. DA-ME-92-145 was issued to demonstrate that adequate hose station coverage is provided for the Intermediate Building Sub-Basement. The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>No additional code differences of significance were identified. | Compliance Assessment 7/86 Report No. 02-0950-1343<br>- DA-ME-92-140, Containment Hose Reel Hydraulic Calculation<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- ECP-10-000834,rev. 0, Perform a comparison between UL and ULC<br>- Ginna UFSAR |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.6.2**<br>**Water Flow and Nozzle Pressure** | 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. | Complies with use of Evaluation | The UFSAR [Sec. 9.5.1.2.3.1 and Sec. 9.5.1.2.3.2] states, "A fire header of sufficient size is provided to deliver an adequate quantity of water throughout the plant at a pressure of no less than 75 psig at the highest nozzle....A 15,000-gal pressure tank (10,000 gal of water) and a 120-gpm centrifugal jockey pump maintain system pressure at a minimum of 100 psig." The Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix D [Table D-3] states that fire hose stations at Ginna do not require the use of pressure reduction devices.<br><br>DA-ME-2000-040 evaluated the capability of the standpipe systems at Ginna to provide an adequate water flow rate and nozzle pressure for hose station as defined in NFPA 14-1976. The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>Fire hose stations at Ginna do not require the use of pressure reduction devices based on pump pressures. Fire Brigade is trained (LP-N1530) without the use of reduction devices. Pressure reducing devices are installed for the containment hose reels, however they are left in the full open position. | - DA-ME-2000-040, City Water Yard Loop X-Tie to Fire Yard Loop Hydraulic Calculation<br>- Ginna UFSAR<br>- LP-N1530 (Lesson Plan) |
| **3.6.3**<br>**Hose Nozzle** | 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 | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.11] states, "Forty-two hose stations are provided to protect various areas of the plant. The nozzles are 1 1/2" fog nozzles pinned to the hose adapters with provision made to prevent use of the straight stream position." | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| | hose nozzles shall have shutoff capability and be able to control water flow from full open to full closed. | | Additionally, the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.11] describes that, hose reels are distributed throughout the station so that safety-related areas in the station are within 20 feet of a fog nozzle when attached to not more than 100 foot lengths of hose.” | |
| **3.6.4 Manual Fire Suppression** | 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). | Complies via Previous Approval | Complies via Previous Approval.<br>Ginna was an operating plant when Appendix A to BTP APCSB 9.5-1 was issued in 1976. Regulatory Position E.3.d relative to the capability to supply water to at least standpipes following a SSE was not applicable to plants under construction or in operation as of July 1, 1976.<br><br>In addition, GL 86-10 [Sec. 7.2 of Enclosure 2 dated 4/14/86] states, "It should be noted that the [seismic standpipe design] guidelines cited above from the BTP CMEB 9.5-1 are not applicable to plants reviewed and approved under BTP APCSB 9.5-1."<br><br>The Federal Register notice that promulgated adoption of NFPA 805 makes the following statement: “A commentor 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 requirements in section 3.6.4 of NFPA 805 is not applicable to licensees with nonseismic standpipes and | - GL 86-10, Generic Letter 86-10, Implementation of Fire Protection Requirements |

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| **3.6.4 Manual Fire Suppression (Continued)** | | | hose stations previously in accordance with Appendix A to BTP APCSB 9.5-1.<br><br>Therefore, Section 3.6.4 of NFPA 805 does not apply to Ginna and regulatory compliance is based on “previously approved alternatives” provision in NFPA 805, Sec.3.1.<br><br>The bases for previous approval remain valid. | |
| **3.6.5 Seismic Required Hose Stations** | 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. | Complies via Previous Approval | Complies via Previous Approval.<br>Ginna was an operating plant when Appendix A to BTP APCSB 9.5-1 was issued in 1976. Regulatory Position E.3.d relative to the capability to supply water to at least standpipes following a SSE was not applicable to plants under construction or in operation as of July 1, 1976.<br><br>In addition, GL 86-10 [Sec. 7.2 of Enclosure 2 dated 4/14/86] states, "It should be noted that the [seismic standpipe design] guidelines cited above from the BTP CMEB 9.5-1 are not applicable to plants reviewed and approved under BTP APCSB 9.5-1." See compliance bases for 3.6.4 above.<br><br>Therefore, Section 3.6.5 of NFPA 805 does not apply to Ginna and regulatory compliance is based on “previously approved alternatives” provision in NFPA 805, Sec.3.1.<br><br>The bases for previous approval remain valid. | - GL 86-10, Generic Letter 86-10, Implementation of Fire Protection Requirements |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.7**<br>**Fire Extinguishers** | Where provided, fire extinguishers of the appropriate number, size, and type shall be provided in accordance with NFPA 10, Standard for Portable Fire Extinguishers. Extinguishers shall be permitted to be positioned outside of fire areas due to radiological conditions. | Complies | Pressurized water, dry chemical, and carbon dioxide portable fire extinguishers are distributed throughout the plant in accordance with the provisions of NFPA10-1984 [EPM-FPPR, Vol. II, Appendix A Table A-1].<br><br>Portable extinguishers have been selected and installed to meet the type of fire emergency which might occur in the areas where the equipment is located. Their location is made conspicuous by signs and notation of the fire extinguisher station number [EPM-FPPR Vol. I, Part II, sec. 10.2.14]." Finally, the fire extinguisher inspection process implemented via SC-3.15.3 meets that prescribed by NFPA 10. | - SC-3.15.3, Portable Fire Extinguisher Inspection<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |
| **3.8.1**<br>**Fire Alarm** | Fire Alarm. Alarm initiating devices shall be installed in accordance with NFPA 72, National Fire Alarm Code. Alarm annunciation shall allow the proprietary alarm system to transmit fire-related alarms, supervisory signals, and trouble signals to the control room or other constantly attended location from which required notifications and response can be initiated. Personnel assigned to the proprietary alarm station shall be permitted to have other duties. The following fire-related signals shall be transmitted: (1) Actuation of any fire detection device (2) Actuation of any fixed fire suppression system (3) Actuation of any manual fire alarm station (4) Starting of any fire pump (5) Actuation of any fire protection supervisory device (6) Indication of alarm system trouble condition | Complies with use of Evaluation | Complies with use of Evaluation<br>The UFSAR [Sec. 9.5.1.2.2] states, "The plant has a protective signaling system which alarms locally in selected parts of the plant and transmits fire alarm, supervisory, and trouble signals to the Control Room. In addition to signals from fire detection devices in various rooms or ventilating systems, the system transmits signals indicating [suppression system] water flow, fire pump operation, fire pump trouble, and low fire water tank level or pressure. Fire alarms are initiated by smoke or heat detectors and by [fire suppression system] water flow or pressure switches. Additional protection is available by installation of tamper switches on major valves, unless they are locked in position. The signaling system is powered by the emergency power supply system and automatically transfers to a 4-hour battery backup supply if normal power supply is interrupted. Fire detection and signaling systems are generally designed and installed in accordance the NFPA 72D." Compliance with NFPA | - RG001680, Safety Evaluation Report Docket No. 50-244, 2/14/1979<br>- DA-ME-2000-052,rev. 0, Fire Detection System<br>- IR 02-0950-1343,rev. 0, R.E.Ginna NFPA Code Compliance Assessment 7/86 Report No. 02-0950-1343<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- SC-3.16.2.1, Operating Instructions Control Room Fire Control Panel<br>- SC-3.16.2.9, Operating Instructions Guardhouse Fire Panel<br>- Ginna UFSAR, rev. 23 |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.8.1 Fire Alarm (Continued)** | | | 72D-1986, "Proprietary Protective Signaling Systems," and NFPA 72E-1984, "Automatic Fire Detectors" has been assessed and documented in the Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix D [Tables D-11 and D-12], and the R.E. Ginna NFPA Code Compliance Assessment [Report No. 02-0950-1343]. Deviations from NFPA 72D evaluated as part of the code review included lack of a system sequential events recorder. However, the NRC accepted the lack of automatic recording capability per RG001680 [Sec. 4.2], Appendix A to BTP APCSB 9.5-1, Position E.1.<br><br>Additional detailed assessment of the adequacy of fire detection system coverage throughout the plant is documented by DA-ME-2000-052, which addresses deviations from NFPA 72E. The credited bases for acceptance are valid and meet applicable quality requirements. | |
| | | Complies | Complies<br><br>The following fire-related signals are transmitted:<br>(1) Actuation of any fire detection device [EPM-FPPR Vol. I, Part II, Sec. 10.2.1, SC-3.16.2.9, and SC-3.16.2.1]<br><br>(2) Actuation of any fixed fire suppression system [EPM-FPPR Vol. I, Part II, Sec. 10.1, SC-3.16.2.9, and SC-3.16.2.1]<br><br>(3) Actuation of any manual fire alarm station [SC-3.16.2.9, and SC-3.16.2.1] Automatic fire alarm systems are actuated through manual pull stations. The system | |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.8.1 Fire Alarm (Continued)** | | | alarms in the Control Room or Guard House (constantly attended location) upon actuation.<br><br>(4) Starting of any fire pump [EPM-FPPR Vol. I, Part II, Sec. 10.1, and SC-3.16.2.1]<br><br>(5) Actuation of any fire protection supervisory device [EPM-FPPR Vol. I, Part II, Sec. 10.2.1, SC-3.16.2.1, and SC-3.16.2.9]<br><br>(6) Indication of alarm system trouble condition [EPM-FPPR Vol. I, Part II, Sec. 10.2.1, SC-3.16.2.1, and SC-3.16.2.9] | |
| **3.8.1.1 Communication** | 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 contantly attended location. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II, Sec. [10.2.25] states, "There are three communication systems within the plant. The primary system is the combination paging and party system; in addition, there is a sound powered phone system and a radio paging system.<br><br>The sound powered system is hard wired with separate wires from the combination paging and party system. The radio paging system provides communication with areas inside the containment with the help of a radio antenna mounted in the containment. Additionally, a repeater located in the Nuclear Assessment Building and remote amplifiers and a distributed antenna system intalled in the plant allows for greater flexibility with radio communications. There is adequate redundancy with these three systems to ensure good communications throughout the plant during any fire emergency." | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- SC-3.13, Fire Communications |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| | | | Additionally, the Fire Communications are administratively controlled via SC-3.13. | |
| **3.8.1.2 Notifying Fire** | 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. | Complies | Means are provide to promptly notify the following of any fire emergency in such a way as to allow them to determine an appropriate course of action:<br><br>(1) General site population in all occupied areas are notified in accordance with SC-3.3.1 [Sec. 3].<br>(2) Members of the industrial fire brigade and other groups supporting fire emergency response are notified in accordance with SC-3.3.1 [Sec. 3].<br>(3) Off-site fire emergency response agencies are notified in accordance with SC-3.3.2 [Sec. 6]. Two independent means of communication is available for notification of off-site emergency services [EP-CE-114-100]. | - SC-3.3.1, Immediate Fire Notification<br>- SC-3.3.2, Offsite Notification of Fire<br>- EP-CE-114-100, Emergency Notifications |
| **3.8.2 Detection** | If automatic fire detection is required to meet the performance or deterministic requirements of Chapter 4, then these devices shall be installed in accordance with NFPA 72, National Fire Alarm Code, and its applicable appendixes. | Complies with use of Evaluation | Required automatic fire detection systems are identified in LAR Section 4.8.<br><br>Complies with Use of Evaluation<br>Compliance with NFPA 72E-1984, Automatic Fire Detectors, has been assessed and documented in the Fire Protection Program Report (EPM-FPPR), Vol. II, Appendix C [Table C-10]. The differences from NFPA 72E requirements identified were:<br>A concern regarding the ability of eight (8) ionization type detectors installed above the Reactor Building Operating Floor (Fire Zone RC-3) to provide adequate area coverage was identified. No other code differences were identified.<br><br>Design Analysis DA-ME-2000-052 documented the acceptability of the installed plant detection systems | - PCR 2000-0048,rev. 1, Smoke Detector Upgrades<br>- DA-ME-2000-052, Fire Detection System<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| **3.8.2 Detection (Continued)** | | | which included the Reactor Containment Building. Minor instances were identified where installation of additional fire detectors was deemed necessary. These fire detector upgrade modifications were implemented via PCR 2000-0048. Based on the completion of these modifications, DA-ME-2000-052 concluded that the fire detection system coverage meets the applicable NRC guidance in GL 86-10. Specifically, the degree and extent of fire detection system coverage was determined to be adequate to protect against the hazards in the respective plant areas. The credited bases for acceptance are valid and meet applicable quality requirements. | |
| **3.9.1 NFPA Standards** | If an automatic or manual water-based fire suppression system is required to meet the performance or deterministic requirements of Chapter 4, then the system shall be installed in accordance with the appropriate NFPA standards including the following: (1) NFPA 13, Standard for the Installation of Sprinkler Systems (2) NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection (3) NFPA 750, Standard on Water Mist Fire Protection Systems (4) NFPA 16, Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems | Complies with use of Evaluation<br><br>Complies with use of Evaluation | Required automatic or manual water-based fire suppression systems are identified in LAR section 4.8.<br><br>(1) Complies with use of Evaluation<br>NFPA 13, Standard for the Installation of Sprinkler Systems Compliance with NFPA 13-1985, Standard for the Installation of Sprinkler Systems has been assessed and documented in the Fire Protection Program Report (EPM-FPPR), Vol. II, Appendix C [Table C-2]. Additionally, the ability of the fire protection water supply to adequately meet the hydraulic demand requirements of automatic and manual water-based suppression systems is addressed in DA-ME-2001-031. The credited bases for acceptance are valid and meet applicable quality requirements.<br>(2) Complies with use of Evaluation<br>NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection Compliance with NFPA 15-1985, Standard for Water Spray Fixed Systems for Fire Protection has been assessed and documented in the | - DA-ME-2001-031, Evaluation of Suppression System Flow and Pressure Requirements<br>- P301845, Perform annual Cleaning of Retention Pond<br>- PCR 2004-0066,rev. 0, Retention Pond Upgrade<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- T-6.16, Draining of the Transformer Yard Storm Drain Retention Pond |

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| **3.9.1 NFPA Standards (Continued)** | | <br><br><br><br><br><br>None<br><br>None | Fire Protection Program Report (EPM-FPPR), Vol. II, Appendix C [Table C-4]. Additionally, the "collection pond" as described in EPM-FPPR, Vol. II, Appendix C, Table C-4, section 4-6.2 was rebuilt in 2004 under PCR-2004-0066 and is drained and cleaned via procedure T-6.16 and Rep Task P301845.<br><br>(3) Not applicable to Ginna NFPA 750, Standard on Water Mist Fire Protection Systems<br><br>(4) Not applicable to Ginna NFPA 16, Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems | |
| **3.9.2 Water Flow Alarm** | Each system shall be equipped with a water flow alarm. | Complies | Each system is equipped with a local water flow alarm as documented in the Fire Protection Program Report (EPM-FPPR), Vol. II, Appendix C [Table C-2 Sec. 3-17.2]. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |
| **3.9.3 Suppression System Annunciation** | All alarms from fire suppression systems shall annunciate in the control room or other suitable constantly attended location. | Complies | All alarms for the actuation of any manual fire alarm station [SC-3.16.2.9, and SC-3.16.2.1] or an automatic suppression system annunciates in the Control Room or Guard House (constantly attended location) upon actuation. | - SC-3.16.2.1, Operating Instructions Control Room Fire Control Panel<br>- SC-3.16.2.9, Operating Instructions Guardhouse Fire Panel |
| **3.9.4 Diesel-driven Fire Pumps** | Diesel-driven fire pumps shall be protected by automatic sprinklers. | Complies | The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II [Sec. 10.2.12.4] states, "Automatic sprinkler systems provide protection for the following: Service Water Pump Area and Fire Pump Area in the Screen House." [Ref. Drawing D381-0314] | - D381-0314, Piping Fire Service Addition<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |
| **3.9.5 OS&Y Gate Valve** | Each system shall be equipped with an OS&Y gate valve or other approved shutoff valve. | Complies | Each system has an outside screw and yoke shutoff valve as documented in the Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix A Table A-1 [Sec. E.3.a], and Vol. II, Appendix C, Table C-5 Sec. [2-9.7]. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| **3.9.6**<br>**Valve Performance** | All valves controlling water-based fire suppression systems required to meet the performance or deterministic requirements of Chapter 4 shall be supervised as described in 3.5.14. | Complies | All valves controlling water-based fire suppression systems required to meet the performance or deterministic requirement of Chapter 4 as identified in LAR Section 4.8 are supervised as described in 3.5.14.<br><br>The Fire Protection Program Report (EPM-FPPR), Vol. I, Part II, [Sec. 10.2.12] states, "All control valves for spray or sprinkler systems are electrically supervised with alarms in the Control Room. Other important valves on the water supply are either electrically supervised or locked in the proper position." | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |
| **3.10.1**<br>**NFPA Standards** | 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:<br>(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 | <br><br><br><br><br>None<br><br><br>Complies with use of Evaluation | Required gaseous fire suppression systems are identified in LAR Section 4.8. The systems are designed and installed in accordance with the following applicable NFPA codes:<br><br>(1) NFPA 12, Standard on Carbon Dioxide Extinguishing Systems. Not Applicable to Ginna.<br><br>(2) NFPA 12A, Standard on Halon 1301 Fire Extinguishing Systems<br>Complies with use of Evaluation: The Relay Room and MUX Room gaseous suppression system is the only required gaseous suppression system required to meet NFPA 805 Chapter 4 requirements.<br><br>The Fire Protection Program Report (EPM-FPPR) Vo1. I, Part II, Sec. [10.2.13] describes the total flooding automatic Halon 1301 extinguishing system of the Relay Room and MUX Room. This system is designed to deliver a 5% concentration of Halon in the protected area. A reserve supply of Halon 1301 for the Relay and MUX rooms permits prompt restoration of automatic | - EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- STP-O-13.4.29, Halon System Testing Relay Room/Computer Room (S08)<br>- PS00447, Reptask |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.10.1 NFPA Standards (Continued)** | | <br><br><br><br>None | protection following a system discharge. The manual actuators (one for each system) for the Relay Room and MUX Room are located to the left of the entrance to the Relay Room. Audible alarms and red lights above the entrance door of the appropriate room are activated when either system is actuated.<br><br>Compliance with NFPA 12A-1985, Halon 1301 Fire Extinguishing Systems has been assessed and documented in the Fire Protection Program Report [EPM-FPPR, Vol.II, Appendix C,Table C-1]. The credited bases for acceptance are valid and meet applicable quality requirements.<br>Additionally, the testing of Relay Room and MUX Room gaseous suppression system is performed semi annually via STP-O-13.4.29 and Reptask PS00447. No code deviations were identified.<br><br>(3) NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems. Not Applicable to Ginna. | |
| **3.10.2 Control Room Alarm** | Operation of gaseous fire suppression systems shall annunciate and alarm in the control room or other constantly attended location identified. | Complies | The Relay Room and MUX Room gaseous suppression system (S08) is the only required gaseous suppression system required to meet NFPA 805 Chapter 4 requirements.<br><br>The Relay Room and MUX Room (S08) gaseous suppression system annunciates and alarms in the Control Room [SC-3.16.2.1 and EWR 1832B]. As described in the UFSAR [Sec. 9.5.1.2.3.8], "Ionization type smoke detectors in the area alarm and annunciate in the control room.....The system is controlled by an electronic control system that is interfaced with the station fire detection system. The control system | - EWR 1832B,rev. 0, Fire signaling system<br>- SC-3.16.2.1, Operating Instructions Control Room Fire Control Panel<br>- Ginna UFSAR |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| | | | coordinates the fire detection system with local alarm actuation, air conditioning and ventilation shutdown, electrical power disconnection, and Halon discharge." | |
| **3.10.3 Ventilation To Prevent Over-Pressurization** | 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. | Complies | Position E.5 of Appendix A to BTP APCSB 9.5-1 discusses consideration of potential enclosure over-pressurization for design of CO2(total flooding) systems. No similar design consideration is discussed by Position E.4 for Halon total flooding systems. Therefore, in general, over-pressurization design considerations should be limited to carbon dioxide total flooding system applications. However, the adequacy of the Relay/MUX Room ventilation system design to withstand over pressurization during agent injection and loss of agent through seals within the Relay/MUX Room boundary was demonstrated via Halon system acceptance testing [Test No. 1078]. The Relay/MUX Room is not a radiologically controlled area. | - Test No. 1078, Ginna Relay Room Total Flooding of Room with Halon 1301 |
| **3.10.4 Single Active Failure** | 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. | Complies | NFPA 805, Section 3.10.4 is clarified in Appendix A, "Explanatory Material" to the standard. As described by A.3.10.4, "The backup gaseous suppression system referred to in this section would be a CO2 hose reel. This backup system does not refer to the primary and alternate bottle banks on a Halon or CO2 system." CO2 extinguishing systems are not used to meet Chapter 4 requirements at Ginna.<br><br>The backup fire suppression capability for the Relay Room Halon system is provided by manually actuated fixed water spray systems, augmented by hose reel [water] coverage as required [EPM-FPPR Vol. I, Part II, Sec. 10.2.12.2]. | - EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.10.5 Disarming Automatic System** | Provisions for locally disarming automatic gaseous suppression systems shall be secured and under strict administrative control. | Complies | Procedure A-52.12 includes administrative control measures for impairment and compensatory actions associated with the Relay/MUX Room Halon suppression system [A-52.12, Sec. 6.7 and Attach. 3]. | - A-52.12, Nonfunctional Equipment Important to Safety |
| **3.10.6 Occupied Areas** | Total flooding carbon dioxide systems shall not be used in normally occupied areas. | None | Not applicable to Ginna.<br><br>Carbon dioxide fire extinguishing systems are not used to meet Chapter 4 requirements. | - None |
| **3.10.7 Audible Alarm** | 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. | None | Not applicable to Ginna.<br><br>Carbon dioxide fire extinguishing systems are not used to meet Chapter 4 requirements. | - None |
| **3.10.8 Lock Out** | Positive mechanical means shall be provided to lockout total flooding carbon dioxide systems during work in the protected space. | None | Not applicable to Ginna.<br><br>Carbon dioxide fire extinguishing systems are not used to meet Chapter 4 requirements. | - None |
| **3.10.9 Secondary Thermal Shock** | 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. | Complies | Ginna's only use of gaseous fire suppression is a Halon 1301 system.<br>Halon 1301 does not present a risk of secondary thermal shock. Per Page 4-156 of the SFPE Handbook of Fire Protection Engineering, Halon 1301 is "Stored as a liquid under pressure and released at normal room temperature as a vapor...." | - SFPE Fourth Edition, Fire Protection Engineering |
| **3.10.10 Corrosive Characteristics** | Particular attention shall be given to corrosive characteristics of agent decomposition products on safety systems. | Complies | Halon decomposition products do not have any corrosive characteristics that have an effect on safety systems. The Fire Protection Handbook [page 17-94] states, "In 1972, following extensive testing by several major companies on the effects of Halon 1301 decomposition products on electrical equipment, the NFPA Committee on Electronic Computer/Data Processing Equipment recognized Halon 1301 total | - SFPE, SFPE Handbook of Fire Protection Engineering, Second Edition<br>- Fire Protection Handbook, Fire Protection Handbook, 20th edition (page 17-94) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.10.10 Corrosive Characteristics (Continued)** | | | flooding systems as suitable for protection of electronic computer/data processing equipment."<br><br>The SFPE Handbook of Fire Protection Engineering [page 4-125] states, "Areas...where damage to equipment or materials....must be minimized are also ideally protected by this agent...Halon 1301 gets into blocked and baffled spaces readily and leaves no corrosive or abrasive residue after use...". | |
| **3.11 Passive Fire Protection Features** | 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. | None | This is a general statement section. Please refer to the following subsections for the specific NFPA 805 subsection requirement and the compliance statement for each. | - None |
| **3.11.1 Building Separation** | Building Separation. Each major building within the power block shall be separated from the others by barriers having a designated fire resistance rating of 3 hours or by open space of at least 50 ft (15.2 m) or space that meets the requirements of NFPA 80A, Recommended Practice for Protection of Buildings from Exterior Fire Exposures. Exception: Where a performance-based analysis determines the adequacy of building separation, the requirements of 3.11.1 shall not apply. | Complies with Clarification | Complies with Clarification:<br>The requirement that major power block buildings be separated by barriers having a designated fire resistance rating of 3 hours or by open space of at least 50 ft or space that meets the requirements of NFPA 80A-2007 is a new requirement in NFPA 805, in that there is no corresponding position in Appendix A to BTP APCSB 9.5-1 or the Ginna current licensing basis. Therefore, previous NRC approval does not pertain to NFPA 805, Section 3.11.1.<br><br>This is a new requirement and as such, there is not a corresponding position within Ginna's current license, and therefore there is not explicit NRC prior approval of | - RG001680, Safety Evaluation Report Docket No. 50-244, 2/14/1979<br>- RG002940, Safety Evaluation Report Supplement 1, 12/17/80<br>- RG003007, Safety Evaluation Report Supplement 2, 2/6/81<br>- RG010540, RG&E Fire Protection Evaluation, 2/24/77<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.11.1 Building Separation (Continued)** | | | this new requirement. The clarification is that Ginna has NRC approval for building separation as discussed in previous SERs.<br><br>Ginna was built prior to this new requirement and as such the only power block building that is separated by at least 50 feet is the Screen House. Most of Ginna's buildings interface with each other and share various walls [33013-2100].<br><br>The Fire Protection Program Report (EPM-FPPR) Vol. I Part III [Sec. 7.0] details the wall boundaries for each fire area. The adequacy of the methods used for building separation have been assessed and accepted by the NRC via the SERs and their supplements as described below:<br><br>The Fire Protection Program Report (EPM-FPPR) Vol. I, Part III [Sec. 5.3] states, “At Ginna Station, the construction of walls, floors, and ceilings is typically either of reinforced concrete construction having a fire rating in excess of three hours or of concrete block construction with a fire rating of at least two hours. Based on this criteria, 17 fire areas were identified at Ginna. The only exceptions to two or three-hour-rated boundary fire barriers occurred in three locations: at the 289 ft 6 in. elevation of the Control Building (Control Room), at the access points into the Cable Tunnel, and at the floor-to-floor interface of the fire areas in the Auxiliary Building."<br><br>Each is discussed separately below. | - License Renewal Safety Evaluation Report, 3/3/04<br>- 33013-2100, Plant Arrangement General Plant Plot Plan and Drawing Index |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.11.1 Building Separation (Continued)** | | | RG001680 [Sec. 4.11] identified a number of instances in which upgrade of original fire barriers, or the need for new fire-rated barriers was needed, and states, “We find that, subject to implementation of the above described modifications, fire barriers in the plant will be adequate to contain fires and are, therefore, acceptable.” Specifically section 4.11 states,"Barrier (walls, floors, and floor-ceiling assemblies) enclosing fire areas generally have 3 hour fire resistance ratings. Barriers which do not have three hour ratings include: the non rated wall separating the 289'-6" elevation of the control building from the turbine building, and the 2 hour rated walls separating these buildings at lower elevations; the non rated walls between the north and south sections of the intermediate building on the 253'-6", 271'-0"/278'-4", and 293'-0"/298'-4" elevations; the 2 hour rated walls between the mechanical equipment room and station battery room A, and between the two battery rooms; the 2 hour rated wall between the relay room and the computer room; and the non rated ceiling assembly of the computer room, which separates it from the relay room. Also, construction joints between the containment and adjoining walls of the intermediate and auxiliary buildings are filled with polystyrene foam which is combustible.<br><br>In addition, there is exposed structural steel in the intermediate building, control complex, turbine building, diesel generator building, turbine oil storage room, and operating floor of the auxiliary building. The structural steel on elevation 217'-0" of the turbine building on elevation 278'-4" of the intermediate buildings are tied together in at least one location." Selected structural steel building members were coated | |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.11.1 Building Separation (Continued)** | | | with a protective material to resist the effects of fires as described in the License Renewal SER [Sec. 2.4.2.3.1].<br><br>RG001680 also states, "The licensee has proposed to install a bullet proof, pressure resistant, steel barrier, between the turbine building and the control room. An automatically actuated water curtain will provide adequate fire resistance for this barrier. The licensee has also proposed to replace the existing computer room ceiling with a 1 hour rated assembly. Construction joints between the containment and adjoining walls will be modified to provide fire resistance rating commensurate with the barriers.<br><br>The rating of fire barriers, including the ceiling, separating the relay room from the computer room will be upgraded to 3 hours, or the combustibles within the computer room be reduced to the level where the hazard can be contained by the proposed barriers. The licensee will evaluate the need to protect the exposed structural steel against the fire damage where failure of such steel could jeopardize the safe shutdown.<br><br>The fire hazards in the mechanical equipment room and in the station battery rooms were reviewed against the fire rating of the walls and it was concluded that the walls are adequate to contain these fire hazards.<br><br>The licensee will establish the adequacy of fire resistance for those walls separating the north and the south sections of the intermediate building, or upgrade them. We find that, subject to implementation of the above described modifications, fire barriers in the plant will be adequate to contain fires and is, therefore, | |

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| **3.11.1 Building Separation (Continued)** | | | acceptable." RG002940 [Item 3.1.21] addresses separation of the Control Building from the Turbine Building and construction joints between Containment and adjoining walls. Specifically, it states, "In the SER, we were concerned that the unrated walls separating the control room from the turbine building would be inadequate to prevent a fire in either the Turbine Building or the kitchen from affecting redundant safe shutdown circuits in the control room. We were also concerned that the design of the water curtain which the licensee proposed to install to protect the unrated walls would not provide timely response or sufficient water spray density to preclude damage to safe shutdown systems from a fire in the Turbine Building.<br><br>By letter dated June 4, 1980 the licensee provided additional information. The water discharge density is according to the guidelines given in NFPA Standard 15 and therefore acceptable. The design of the water curtain will be in accordance with NFPA Standard 15. The system will be actuated by a heat detection system. The detector heads will have a heat collector canopy directly over it to assist in decreasing delayed actuation. The fire water piping will be hydraulically designed to accommodate two hose streams operating with the water curtain. The fire pump has the capacity to supply the required pressure and water flow.<br><br>Based on our evaluation, we conclude that the water curtain protection proposed by the licensee will adequately protect the wall between the control room and the turbine building and, therefore, is acceptable with regards to fire protection." | |

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| **3.11.1 Building Separation (Continued)** | | | RG003007 [Item 3.2.8] addresses fire barrier concerns with the Diesel Generator Rooms, Turbine Building, and Screen House. The Hydrogen Seal Oil Unit Enclosure is located in Fire Area BOP, at approximately column lines D and 10 and consists of walls and ceiling constructed of sheet metal studs and fire rated drywall covering materials to provide the structure with an overall one (1) hour fire rating. The floor is non-rated to grade. The overhead doors in the enclosure are fusible link operated rolling fire doors. S25 is an automatic deluge suppression system which protects the Hydrogen Seal Oil Unit area. A trench surrounds the Hydrogen Seal Oil Unit and contains drains that control flammable liquid spills from impacting adjacent areas. The current safe shutdown analysis for App. R demonstrates shutdown from outside the area. Steel is not protected. The Fire Protection Program report (EPM-FPPR) Vol. I, Part III [Sec. 7.3] describes that Pyrocreted structural steel was installed in area of Turbine Lube Oil Reservoir. Pyrocrete structural steel upgrades have been provided in the second story barriers to the Turbine Building where structural steel interfaced with block wall material construction. Exposed structural steel was not protected in the areas of the hydrogen seal oil unit, turbine island, condenser pit, or Screen House since Appendix R safe shutdown can be achieved from outside these fire areas [EPM-FPPR, Vol. II, Appendix A, Table A-1]. | |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.11.2**<br>**Fire Barriers** | Fire barriers required by Chapter 4 shall include a specific fire resistance rating. Fire barriers shall be designed and installed to meet the specific fire resistance rating using assemblies qualified by fire tests. The qualification fire tests shall be in accordance with NFPA 251, Standard Methods of Tests of Fire Endurance of Building Construction and Materials, or ASTM E 119, Standard Test Methods for Fire Tests of Building Construction and Materials. | | Appropriately rated fire barriers are provided or have been found acceptable by the NRC or by licensee evaluation.<br><br>The Fire Protection Program Report (EPM-FPPR) Vol. I, Part II, Sec. [10.2.18] states, "Fire barriers are located throughout the plant to separate established fire areas from each other and also to separate certain safety related areas from the remainder of the plant. These barriers are designed to stop a fire from propagating from one area to the other based upon the fire rating of the barrier. All penetrations in these barriers are sealed with appropriate materials to match the rating requirements of the barrier. Fire areas have been defined based upon separation of equipment and cables to ensure that at least one path of safe shutdown systems is always available.<br><br>The fire hazards analysis submitted to the NRC in February 1977 (RG010540) identified the fire barriers in the plant and the requirements for maintaining their integrity. These barrier requirements were determined by the fire loadings calculated for each area subject to a potential fire hazard. As a result of this analysis, several design modifications were implemented at the plant including upgrading of the rating of original barriers and installing new barriers. Additional definition of fire areas and barriers and analysis of fire zones were conducted as part of the 10CFR50, Appendix R, review effort. The addition of the water curtain around the perimeters of the stairwells and equipment hatch at the ceiling level of the Auxiliary building mezzanine floor is a part of this effort. Also, 3 hour rated dampers were installed in ducts penetrating these fire areas. | - RG006079, NRC Correspondence, 3/21/85<br>- RG010540, RG&E Fire Protection Evaluation, 2/24/77<br>- DA-ME-2003-018,rev.1, Appendix R Barrier Replacement<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR) |

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| **3.11.2 Fire Barriers (Continued)** | | | New fire barrier materials were installed in the emergency diesel generator cable vault, battery room 1B, the charging pump room, the Auxiliary building, the Intermediate building, and the Containment."<br><br>In certain instances, specific exemptions from regulatory requirement were requested and granted [RG006079]. Specific exemptions are included in the Fire Protection Program Report (EPM-FPPR) Vol. III, Part IV, [Sec. 9.0]: | |
| | | Complies w/use of Evaluation | Complies w/use of Evaluation<br>Fire Area CT<br>Prior Exemption (classified as adequate for the hazard through DA-ME-13-001) from the rating boundary requirement for either a 1 or 3 hour fire barrier between CT and AHR, CT and IBN, and CT and ABBM. The bases for Granting the original Exemption [EPM-FPPR Vol. III, Part IV, Sec. 9.2.8] are:<br>(1)The barriers are continuous and constructed of noncombustible materials. There is reasonable assurance that during the initial stages of a fire, before significant temperature rise occurs, the barriers will be able to confine the products of combustion to one side of the barrier.<br>(2)The fire area will be protected by an area-wide fire detection system. As a result, potential fire will be detected in its formative stages, before significant propagation or temperature rise occurs. Fire would be suppressed by manual suppression by the fire brigade.<br>(3)If rapid temperature rise occurs at the Cable Tunnel before the arrival of the fire brigade, the existing automatic sprinkler systems located on both sides of the barrier will activate to control the fire, reduce room | - DA-ME-13-001, rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805 |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.11.2 Fire Barriers (Continued)** | | | temperature and protect the barrier from the effects of the fire. DA-ME-13-001 documents that the bases for the original exemption remain valid and the existing design features are adequate for the hazard. The credited bases for acceptance are valid and meet applicable quality requirements. | |
| | | Complies w/use of Evaluation | Complies w/use of Evaluation<br>Fire Area EDG1B<br>Prior Exemption (classified as adequate for the hazard through DA-ME-13-001) from III.G.2 three-hour barrier required between emergency diesel generator feeds in Fire Area EDG1B. The bases for Granting the original Exemption [EPM-FPPR Vol. III, Part IV, Sec. 9.2.9] are:<br>"(1)A full height sheet metal enclosure separates redundant circuits for EDG 1A and 1B. The barrier is continuous and constructed of noncombustible materials. There is reasonable assurance that during the initial stages of a fire, before significant temperature rise occurs, the barriers will be able to confine the products of combustion to one side of the barrier.<br>(2)Fire detection is located in the area and fire will be detected in its formative stages, before significant propagation or temperature rise occurs and fire would be suppressed by manual suppression by the fire brigade.<br>(3)In the EDG vault the licensee has utilized a silicone foam in the construction of the barrier that has passed the ASTM E-119 fire exposure test for 3 hours. In addition, the licensee committed to protect the steel with a UL listed "fire-proofing" which provides reasonable assurance that conducted heat will not pose | - DA-ME-13-001, rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805 |

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| **3.11.2 Fire Barriers (Continued)** | | | a threat to the shutdown related cables within the barrier". A replacement barrier was installed and evaluated under DA-ME-2003-018 Rev. 1 (Complies with use of Evaluation). DA-ME-13-001 documents that the bases for the original exemption remain valid and the existing design features are adequate for the hazard. The credited bases for acceptance are valid and meet applicable quality requirements. | |
| | | Complies w/use of Evaluation | Complies w/use of Evaluation<br>Fire Area BR1B<br>Prior Exemption from III.G.2 requirements to provide protection to the structural steel in Battery Room 1B equivalent to that of the barrier. The bases for Granting the original Exemption [EPM-FPPR Vol. III, Part IV, Sec. 9.2.10] are:<br>(1)The licensee committed to protect the exposed structural steel in Battery Room 1B with material that has a 1-hour fire rating. The exposed steel in Battery Room 1A will not be protected because the floor/ceiling is not relied upon to separate redundant shutdown systems in adjoining fire areas.<br>(2)The combustible load in the battery rooms is low (12 minute fire). Therefore, the common wall between the battery rooms (2-hour rated) and the 1-hour fire proofing on the structural steel in the ceiling of battery room 1B offer adequate fire protection.<br>(3)Fire detection is provided in the battery rooms and will detect a fire in its initial stages before significant temperature rise occurs. Therefore, there is reasonable assurance that the fire will be extinguished by the fire brigade before it becomes a significant threat to the integrity of the fire barriers. The specific quantity of | - DA-ME-13-001, rev. 0, Evaluation of R.E. Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805 |

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| **3.11.2 Fire Barriers (Continued)** | | | combustibles in fire area BR1B have changed over time due to plant modifications and use of higher heat of combustion values for battery cases. However, the fire hazards in BR1B are not of the severity that the 1-hour structural steel fire proofing would be compromised. DA-ME-13-001 documents that the bases for the original exemption remain valid and the existing design features are adequate for the hazard. The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>The Fire Protection Program Report (EPM-FPPR) Vol. I, Part III [Sec. 7.0] details each of the individual fire areas with a description of the rated fire barriers. | |
| **3.11.3 Fire Barrier Penetrations** | Penetrations in fire barriers shall be provided with listed fire-rated door assemblies or listed rated fire dampers having a fire resistance rating consistent with the designated fire resistance rating of the barrier as determined by the performance requirements established by Chapter 4. (See 3.11.3.4 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 | Complies | Doors and dampers in fire barriers required by Chapter 4 are generally listed fire-rated door assemblies and listed rated fire dampers having a fire resistance rating consistent with the designated fire resistance rating of the barrier.<br>Sub-Element (1): Complies<br>The commitment to NFPA 80-1986, Standard for Fire Doors and Fire Windows, is documented in the Fire Protection Program Report (EPM-FPPR) Vol. II, Appendix A, Table A-1, [Sec. D.1.j.]. The commitments are organized based on fire area interfaces.<br>Additionally, the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II, Sec. [10.2.21] states, "Fire door assemblies (doors, frames, and hardware) are generally provided in door openings in required fire barriers. These assemblies are UL listed as either 3-hour rated ("A" label), 1 1/2 hour rated ("B" label) or 3/4 hour rated ("C" label). Three hour rated doors are provided in three hour or less rated fire barriers, 1 1/2 hour | - DA-ME-93-119,rev.0, Fire Damper Replacement<br>- EPM-FPPR ANL, Fire Protection Program Report (FPPR)<br>- FPS-15, Fire Protection and Safety Procedure<br>- DA-ME-93-117B,rev. 0, Out of Wall and Special Fire Damper Configurations<br>- EWR 4882, Fire Dampers<br>- EWR 2463,rev. 1, Fire Dampers<br>- M-103, Inspection and Maintenance of Fire Dampers<br>- STP-E-13.26, Testing of Fire Dampers |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
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| **3.11.3 Fire Barrier Penetrations (Continued)** | the area. Openings in fire barriers shall be permitted to be protected by other means as acceptable to the AHJ. | | rated doors are provided in barriers that require a 2 hour or less fire rating, and 3/4 hour rated doors are provided in certain barriers for property conservation purposes". Fire Protection and Safety Procedure FPS-15 also includes the requirement that fire door assemblies shall include UL or FM label. | |
| | | Complies with use of Evaluation | Sub-Element (2): Complies with use of evaluation<br>As stated in the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II Sec. [10.2.22], "Fire dampers are generally provided in HVAC ducts that penetrate required fire barriers to prevent the propagation of a fire through the duct. Some duct penetrations do not have fire rated dampers and have been evaluated in appropriate engineering evaluations documented in Appendix E (Summary of Fire Protection Engineering Evaluations) of the FPPR". The applicable engineering evaluations include:<br>Design Analysis DA-ME-93-117B which documents (37) fire dampers to ensure/justify that these installations are adequate for the fire rated barriers they penetrate and that the configurations are adequate to withstand the hazards in the fire area in which they are installed. The review documents the adequacy of the configuration per UL and NFPA recommendations along with the hazards associated with the fire areas in which they are installed.<br>Design Analysis DA-ME-93-119 which evaluated the replacement fire dampers for AH-44, BA-33 and BB-46. Many dampers were installed under EWR 2463 [Design Criteria] and EWR 4882 [Design Criteria], using NFPA 90A in the design and installation. The credited bases for acceptance are valid and meet applicable quality | |

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| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.11.3 Fire Barrier Penetrations (Continued)** | | Complies | requirements. In addition, Inspection and Maintenance Procedure M-103, ensures the UL or FM label for hour rating, and the testing of Fire Dampers are controlled via STP-E-13.26.<br><br>Sub-Element (3): Complies<br>NFPA 101-2009 compliance is achieved through NFPA 80 and NFPA 90A. NFPA 101, 2009 edition, refers to NFPA 80 in regards to rated fire door assemblies, and NFPA 90A in regards to rated fire dampers. Table B-1 section 3.11.3 (1) and 3.11.3 (2) discuss compliance of NFPA 80 and NFPA 90A. | |
| **3.11.4 Through Penetration Fire Stops** | 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 resitive 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 | Complies with use of Evaluation | As stated in the Fire Protection Program Report (EPM-FPPR) Vol. I, Part II, Sec. [10.2.23], "Fire barriers are located throughout the plant to separate major areas from each other and also to separate certain safety related areas from the remainder of the plant. These are designed to stop a fire from propagating from one area to another based upon the rating of the barrier wall. All penetrations in these barriers are sealed with appropriate materials to match the hourly rating requirements of the barrier.<br>Visual inspection of fire barrier penetration seals are regularly performed to insure that the penetration seals will continue to perform their design function. There are no rated fire barriers that perform a pressure sealing function."<br><br>(a) The adequacy of through opening penetration seal design in regards to maintaining the fire resistance of the fire barrier and tested in accordance with a fire test protocol for electrical, mechanical/piping, and construction joint seals is described below: | - RG002940, Safety Evaluation Report Supplement 1, 12/17/80<br>- ME-92-0006,rev.0, Analysis of Pen's and Fire Barriers<br>- DA-CE-93-081,rev.1, Pressure Wall Seals<br>- DA-ME-94-118-00,rev. 0, Fire Barrier Penetration Seal<br>- DA-ME-94-118-01,rev. 0, Fire Barrier Penetration Seal Qualification Analysis<br>- DA-ME-94-118-02,rev. 0, Fire Barrier Penetration Seal Qualification Analysis<br>- DA-ME-94-118-04,rev.0, Fire Barrier Seal Qualification<br>- DA-ME-94-118-05,rev.0, Fire Barrier Seal Qualification |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.11.4 Through Penetration Fire Stops (Continued)** | 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. | | Electrical [UFSAR Sec. 9.5.1.2.4.10]<br>"Electrical Seals for electrical penetrations fall into two major categories: 1) Seals installed in 1975 using BISCO SF-20; and 2) Seals installed since September 1979 using Dow Corning 3-6458. The adequacy of several fire endurance tests and their applicability to cable tray and conduit penetration seals was documented in a NRC submittal in June 1980. The NRC concurred with the evaluation via RG002940 [Item 3.2.5], which states, "The licensee verified, and we agree, that the seal designs at Ginna are either similar to or more conservative than the seal designs tested by the ASTM E-119 fire test method for a 3-hour rating. Based on our review, we conclude that the licensee has verified that electrical penetration seals are of a 3-hour rated design as tested by the ASTM E-119 test method and, therefore, are acceptable." NRC Information Notice 88-04 alerted licensees that some fire barrier penetration seal designs may not be adequately qualified for the design rating of the penetrated fire barriers. As part of RG&E's review in response to Information Notice 88-04, a program was established to evaluate fire barrier penetrations against a tested configuration and examine the qualification test documentation. Branch Technical Position (BTP)-APCSB 9.5-1 requires that cable and cable tray penetrations of fire barriers (vertical and horizontal) be sealed to give protection at least equivalent to that of the fire barrier. Although not specifically stated in APCSB 9.5-1 that penetration designs must be qualified by tests, RG&E proceeded with this program in order that the penetrations would continue to meet a tested configuration, when being maintained or involved in a plant modification, thereby ensuring the barrier would not be degraded. | - DA-ME-94-118-06,rev.0, FB Seal Qualification for CT Air Handling Room Smoke Barrier<br>- DA-ME-94-118-07,rev.0, FB Seal Qualification for RR Floor Penetration<br>- DA-ME-94-118-08,rev.0, Fire Barrier penetration Seal Analysis<br>- DA-ME-94-118-09,rev.0, Fire Barrier Seal Qualification<br>- DA-ME-94-118-10,rev. 0, Fire Barrier Penetration Seal Qualification Analysis<br>- DA-ME-94-118-11,rev. 0, Fire Barrier Penetration Seal Qualification Analysis<br>- DA-ME-94-118-12,rev. 0, Fire Barrier Penetration Seal Qualification Analysis<br>- DA-ME-94-118-13,rev. 0, Fire Barrier Penetration Seal Qualificaiton Analysis for Non Regulatory Fire Barrier Seals<br>- DA-ME-94-118-14,rev. 0, Temporary Penetration Seals<br>- DA-ME-94-118-15,rev. 0, Fire Barrier Penetration Seal Qualification Analysis<br>- DA-ME-94-118-16,rev. 0, Fire Barrier Penetration Seal Qualification Analysis |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.11.4 Through Penetration Fire Stops (Continued)** | | | For fire barrier penetration seals for which it is not possible to achieve a duplication of a specific tested configuration, appropriate compensatory measures are taken, such as posting fire watch patrols when required by the Technical Requirements Manual (TRM) section 3.7.5, temporarily repairing and qualifying the penetration until it can be reworked, and performing technical evaluations to demonstrate that the penetration<br><br>meets an equivalent level of protection. Guidance from Generic Letter 86-10 is employed in these cases."<br><br>Mechanical / Piping [UFSAR Sec. 9.5.1.2.4.11]<br>"Piping penetrations of fire barriers are either poured in place or sealed by one of the following methods: grout, silicon RTV foam, or flexible silicone-rubber boots. The fire rating adequacy of the seals was documented in a NRC submittal in June 1980. The NRC concurred with the evaluation via RG002940 [Item 3.1.24] which states, "By a June 4, 1980 letter, the licensee referenced FM Test Reports 24963, J.I. 1A5Q6.AC, and 26543, and CTL Reports SF-20 and SF-15OL. The penetration seals at Ginna are of the design and type tested and described in the above test reports. The tests followed the ASTM E-119 fire test method. Based on the data in these test reports, we conclude that the penetration seal designs have been properly verified and, therefore, are acceptable.”<br><br>Construction Joints [UFSAR Sec. 9.5.1.2.4.14]<br>Construction joints between containment and surrounding buildings provide fire resistance commensurate with the hazards. RG002940 [Item | - DA-ME-94-118-17,rev. 0, Fire Barrier Penetration Seal Qualification Analysis<br>- DA-ME-94-118-18,rev. 0, Fire Barrier Penetration Seal Qualification Analysis<br>- DA-ME-94-118-19,rev. 0, Special Boot Seals Evaluation<br>- DA-ME-94-118-99,rev. 0, Penetration Seal Design Bases<br>- ME-91-0020,rev.0, Penetration Analysis<br>- ME-91-0022,rev.1, Penetration Analysis NCR 91-410<br>- DA-ME-93-117A,rev.0, GL 86-10 Evaluation for Containment Electrical Penetrations<br>- DA-ME-92-101, rev.0,Penetrations Analysis<br>- DA-ME-92-105,rev.0, CR Fire Penetration Seals and Combustible Loading<br>- Ginna UFSAR |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.11.4 Through Penetration Fire Stops (Continued)** | | | 3.1.25] provides the NRC's evaluation which states, "By a June 4, 1980 letter, the licensee referenced SWRI fire test report CTM-0200. It describes the results of testing construction joints using silicone foam material, which is what the licensee proposes to use. The joint seal tested was 6" deep and 6" wide and successfully passed the ASTM E-119 fire test. The construction joint seals at Ginna are 12" deep and less than 4" wide,<br><br>therefore, the seals are of a more conservative design than that tested. Based on the test results, the licensee's proposal to upgrade the construction joint seals with silicone foam material is acceptable."<br><br>The DA-ME-94-118 series of engineering evaluations (DA-ME-94-118-00 through DA-ME-94-118-02, and DA-ME-94-118-04 through DA-ME-94-118-19, and DA-ME-94-118-99) that was prepared in response to IN 88-04 document the adequacy of the various electrical cable, piping, and duct penetration seal designs utilized at Ginna. In addition, DA-ME-92-101, DA-ME-93-117A, DA-CE-93-081, DA-ME-92-105, ME-91-0020, ME-91-0022, and ME-92-0006 document the acceptability of various penetrations. The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>(b) The adequacy of internal conduit seal designs are based on provision of an internal fire seal that has an equivalent fire resistive rating to that of the fire barrier through opening fire stop.<br><br>DA-ME-94-118-17 was prepared in response to IN 88-04 and serves to document the adequacy of internal conduit seal designs utilized at Ginna. The credited | |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| | | | bases for acceptance are valid and meet applicable quality requirements. | |
| **3.11.5 ERFBS** | "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 | Complies | Ginna is not crediting the existing HEMYC wrap configurations within the plant as a fire rated barrier, with the exception of fire area BR1B (Battery Room 1B) to protect cables L0318, C0687, and a portion of E0053 as described below:<br><br>An analysis has been performed to address the commitment of LAR attachment S, Table S-2, Item 7. The analysis (Ref. 0028-0018-000-001) compares the Ginna Hemyc wrap configuration in Battery Room B to the following test configurations and is representative of the wrap configuration in the field (air drops, terminations, support/interference protection, collars, etc.):<br><br>Omega Point Laboratories, Inc., Project Number 14790-123264, Date: April 18, 2005, Titled: HEMYC (1-Hour) Electrical Raceway Fire Barrier Systems Performance Testing: Cable tray, Cable Air Drop and Junction Box Raceways.<br><br>Intertek Testing Services NA, Inc., Report Number 3106846, Revision Date: February 5, 2007, Titled: HEMYC 1-Hour Electrical Raceway Fire Barrier System (ERFBS), Fire Resistance Performance.<br><br>Furnace temperatures used in the testing follow the ASTM E-119 time-temerature curve. The specific combustible loading in BR1B is not an input in the analysis (Ref. 0028-0018-000-001). | - Attachment S-2, item 7<br>- 0028-0018-000-001, Qualification of HEMYC Fire Barrier Wrap in Battery Room B of Ginna Nuclear Station, Revision 02.<br>- Work Order (WO) C92936867<br>- ECP-18-000200, Technical Evaluation for Tear in Hemyc Wrap HWCB03. |

| NFPA 805 Chapter 3 Reference | Requirements/Guidance | Compliance Statement | Compliance Basis | References |
|---|---|---|---|---|
| **3.11.5 ERFBS (Continued)** | issuance of Generic Letter 86-10, 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." | | The results of the evaluation (Ref. 0028-0018-000-001) indicate that the Hemyc wrap configuration will be able to provide 25 minutes of protection after the damage temperature (205 $^{0}$C) of the thermoplastic cables is reached. This is provided that the Unistrut supports inside the steel cable chase are stuffed with ceramic fiber material to ensure a path for combustion products does not exist. 205 $^{0}$C is the damage temperature of the thermoplastic cables according to NUREG/CR-6850 and as referenced in the Fire PRA notebook G1-FSS-F001. The credited bases for acceptance are valid and meet applicable quality requirements.<br><br>The installation of the needed ceramic fiber has been installed via work order C92936867.<br><br>A tear was identified in HWCB03 under IR 04108798. In accordance with ECP-18-000200-309-101-01, the area near the Hemyc wrap tear reaches a maximum temperature of 101 $^{0}$C at 30 minutes. These values are less than the damage temperature of thermoplastic cables (i.e. 205 $^{0}$C), and therefore, the tear is considered acceptable without repair. | |

# APPENDIX C NFPA CODE COMPLIANCE SUMMARY

## 1.0 PURPOSE

The purpose of this National Fire Protection Association (NFPA) Code Compliance Summary is to summarize the existing Rochester Gas & Electric (RG&E) NPFA Code Compliance Assessment (Reference 5.1) and to identify RG&E close-out actions taken to resolve code compliance discrepancies at RG&E's Ginna Nuclear Power Plant. This document supersedes Impell Report No. 02-0950-1343, "R.E. Ginna Station NFPA Code Compliance Assessment" dated July 1986 (Reference 5.1). The following applicable NFPA codes were analyzed in the Code Compliance Assessment:

1. NFPA12A, "Halon 1301 Fire Extinguishing Systems", 1985 Ed.
2. NFPA 13, "Installation of Sprinkler Systems", 1985 Ed.
3. NFPA 14, "Standpipe and Hose Stations", 1983 Ed.
4. NFPA 15, "Water Spray Fixed Systems", 1985 Ed.
5. NFPA 20, "Centrifugal Fire Pumps", 1983 Ed.
6. NFPA 24, "Private Fire Service Mains and Their Appurtenances", 1984 Ed.
7. NFPA 26, "Supervision of Valves Controlling Water Supplies for Fire Protection", 1983 Ed.
8. NFPA 37, "Stationary Combustion Engines and Gas Turbines", 1984 Ed.
9. NFPA 72D, "Proprietary Protective Signaling Systems", 1986 Ed.
10. NFPA 72E, "Automatic Fire Detection", 1984 Ed.

The following NFPA codes were analyzed as part of the NFPA 805 transition:

11. NFPA 600, “Standard on Industrial Fire Brigades”, 2000 Ed. Reference 51-9159544.
12. NFPA 50A, “Standard for Gaseous Hydrogen Systems at Consumer Sites”, 1973/1978 Ed. Reference DA-ME-2002-005.
13. NFPA 30, “Flammable and Combustible Liquids Code”, 2000 Ed. Reference 51-9159545.
14. NFPA 805 Chapter 3, 2001 Ed. Reference Appendix B. Note: The detailed code compliance reviews for NFPA 10, 51B, 80, 80A, 90A, 101, 220, 241, 256, and 701 were not performed. The specific code requirement for which Ginna is committed to is specified within the B-1 table.
15. NFPA 805 Chapter 2, section 2.4.2, 2001 Ed. Nuclear Safety Capability Assessment is documented in 51-9191818-000.
16. NFPA 805 Chapter 4, 2001 Ed., Determination of Fire Protection Systems and Features, Reference Appendix H, Table “B-3”.
17. NFPA 805 Chapter 1.5.2, 2001 Ed., Radioactive Release Performance Criteria. Reference Appendix F.

## 2.0 CONCLUSIONS

Table C-1 along with the documents listed in section 1.0, provides a verifiable and consise status for NFPA Code Compliance issues identified for Ginna Nuclear Power Plant and the compliance methods used (action taken, plant modification/procedure) to resolve these issues.

## 3.0 BACKGROUND

Plant fire protection features and administrative procedures for RG&E's Ginna Station were originally evaluated in 1986 with respect to the NFPA code in effect at the time of the review. The assessment of plant features and administrative procedures was conducted using a list of NFPA codes developed through the review of RG&E commitments to APCSB 9.5.1 Appendix A and 10CFR50 Appendix R. An NFPA code checklist was then developed through the review of the applicable NFPA codes. NFPA code sections identified in this checklist were evaluated through field walkdowns and review of plant administrative procedures. The results of this evaluation, including the identification of non-compliance issues and recommendations for further action, were documented in the 1986 Impell NFPA Code Compliance Report (Reference 5.1).

Code compliance discrepancies identified in the 1986 Impell Report (Reference 5.1) were subsequently addressed by RG&E for corrective action. The 1998 NFPA Code Compliance Summary identifies the applicable NFPA code sections utilized, resultant findings, (of the 1986 Impell Report), the compliance methods (actions taken, plant modification/procedure) used by RG&E and an up-to-date status of the NFPA code discrepancies.

As part of the NFPA 805 transition, other code compliance assessments were performed and documented as referenced in section 1.0.

Modifications to existing systems/components relative to the fire protection program will abide to NFPA 805, 2001 edition code. Within this NFPA 805, 2001 edition there are many codes. Minimally, the applicable code edition year or later edition, as referenced in the B-1 Table (Appendix B), shall be used relative to future modifications at Ginna.

## 4.0 DESIGN INPUTS

The following sections define the design inputs used in the 1998 RG&E NFPA Code Compliance Summary and specifies the source of the design input:

## 4.1 NFPA Code Conformance Checklist

The NFPA Code Conformance Checklist defines the list of NFPA Codes and code sections used in the evaluation of plant fire protection and administrative procedures. The checklist was obtained from Appendix A of the 1986 Impell Report (Reference 5.1).

## 4.2 NFPA Code Conformance Results

The results (findings and recommendations) of the NFPA Code Conformance Compliance

Assessment identify plant conditions with respect to the requirements of the NFPA Code Conformance checklist. Where discrepancies in code conformance were discovered, recommendations were made to correct the area of non-compliance. Findings and recommendations were obtained from the 1986 Impell Report (Reference 5.1).

## 4.3 RG&E Close-out Actions

RG&E close-out actions to areas of non-compliance identified by Impell were documented by RG&E through inter-office correspondence as documented in the 1986 Impell Report. These status reports, (File: EHHM017) which are dated October 18, 1986 (Reference 5.2) and December, 15, 1986 (Reference 5.3), were provided by RG&E.

# 5.0 REFERENCED DOCUMENTS FOR TABLES C-1 through C-10

5.1 Impell Corporation Report No. 02-0950-1343, "R.E. Ginna Station NFPA Code Compliance Assessment", Rev. 0, July 1986.

5.2 RG&E Inter-office Correspondence, "Status on Impell's NFPA Open Items", dated October 18, 1986.

5.3 RG&E Inter-office Correspondence, "Status on Impell's NFPA Open Items - Update", dated December 15, 1986.

# 6.0 ASSUMPTIONS FOR TABLES C-1 through C-10

## 6.1 1986 Impell Report

### 6.1.1 NFPA Code Conformance Checklist

The NFPA Code Conformance Checklist from the 1986 Impell report (Reference 5.1) is assumed to be accurate and complete.

### 6.1.2 Analysis

The analysis of plant fire protection features and procedures, including the findings and recommendations outlined in the Impell Report (Reference 5.1), are assumed to be accurate and complete.

## 6.2 RG&E Close-out Actions

The documentation of close-out actions taken by RG&E (Reference 5.2 and 5.3) are assumed to be accurate and complete.

# 7.0 COMPUTER CODES FOR TABLES C-1 through C-10

Computer codes are not applicable to the 1998 NFPA Code Compliance Summary.

# 8.0 ANALYSIS FOR TABLES C-1 through C-10

The 1998 NFPA Code Compliance Summary was performed by completing the following activities:

8.1 The 1986 Impell NFPA Code Compliance Report (Reference 5.1) was reviewed and compared with RG&E inter-office correspondences for identification of close-out actions taken by RG&E to address the identified NFPA code deficiencies.

8.2 A table was developed to summarize the NFPA codes, applicable code sections, findings and recommendations, RG&E close-out actions, and the current status of the code compliance deficiencies.

# 9.0 RESULTS FOR TABLES C-1 through C-10

This 1998 NFPA Code Compliance Summary for RG&E's Ginna Nuclear Power Plant provides a listing of the applicable NFPA codes and identified code sec- tions used to perform the 1986 Impell Code Compliance Assessment, as well as the findings and recommendations resulting from this assessment. Additionally, this summary provides an updated list of RG&E close-out actions taken, the compliance method utilized (plant mod- ification/procedure) and a status of the code compliance deficiencies.

# Table C-1

## RG&E NFPA Code Compliance Summary Table for NFPA 12A - Halon 1301 Fire Extinguishing Systems, 1985 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTIONS REQUIRED | STATUS |
|---|---|---|---|---|
| 1-8.2 | Automatic Detection, listed devices | Automatic detection coverage adequate, listed devices utilized. | No further action required. | OK |
| 1-8.3.2 | Operated devices listed | Operating devices listed for fire service. | No further action required. | OK |
| 1-8.3.3 | Adequate and reliable source of energy | Adequate and reliable source of energy (primary and standby) provided. | No further action required. | OK |
| 1-8.3.6 | Automatically operated valves controlling agent release and distribution provided with approved independent means for emergency manual operation | Automatically operated valves controlling agent release, along with an approved independent means for emergency manual operation provided. | No further action required. | OK |
| 1-8.4 | Supervision of automatic systems provided | Supervision of automatic system provided. | | OK |
| 1-8.5.5 | Warning and instruction signs at entrances to and inside Halon protected areas | In 1986, Impell identified that warning and instruction signs were provided at the entrance to Computer room only, and that warning and instruction signs were not provided at the entrance to Relay Room. Instruction and warning signs provided did not include accurate instructions.<br><br>A recommendation was made by Impell to place warning and instruction signs at the entrance to the Relay Room. Instructions provided on sign should coincide with warning device (e.g., If signs state "flashing light indicates actuation of Halon," then warning light should be of flashing type, existing light does not flash).<br><br>As a result of the recommendation, the signs were installed and verified by field walkdown by E. Mui on 10/18/86. As a result, this issue was closed. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTIONS REQUIRED | STATUS |
|---|---|---|---|---|
| 1-9.1 | Quantities:<br>a. Amount of Halon sufficient for largest single hazards<br>b. Storage container arrangement (located as near as possible to protected area) | Halon quantities are sufficient to meet design requirements, with storage containers stored as near as possible to protected area. Spare cylinders are stored in the offsite warehouse as required by the TRM. | No further action required. | OK |
| 1-9.5 | Storage Containers:<br>a. Each container shall have a permanent nameplate specifying the agent, tare and gross weight, and superpressurization level | In 1986, Impell identified that permanent nameplates were not affixed to each container, specifying the agent, tare and gross weight and superpressurization level.<br><br>A recommendation was made by Impell that the service company or Halon supplier attach nameplates with information specified above to each cylinder during cylinder testing or routine servicing.<br><br>As a result of this recommendation, the signs were installed and verified by field walkdown by E. Mui on 10/15/86. As a result, this issue was closed. | No further action required | OK |
| 1-9.5.5 | Container Test:<br>a. Test and inspection data | All Halon storage containers meet container test requirements. | No further action required. | OK |
| 1-9.5.6 | Manifolded containers adequately mounted and rack supported, provide convenient individual servicing, automatic means provided to prevent agent loss for manifold when any container removed | System discharge piping is not manifolded; this section not applicable. | No further action required. | OK |
| 1-10.5 | Discharge nozzles listed | Discharge nozzles are listed for fire service use. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTIONS REQUIRED | STATUS |
|---|---|---|---|---|
| 1-11 | Inspection maintenance and instructions:<br>a. Annual inspection<br>b. Semi-annual, agent quantity and pressure verification<br>c. Weight and pressure of container recorded, inspection tag on container | Inspection and maintenance procedures:<br>a. Semi-annual cylinder weight and pressure inspection provided<br>b. Annual system inspection not performed. Inspection frequency (18 month) required per Technical Requirements Manual (TRM).<br>A recommendation was made by Impell to use an annual frequency for the system function test. However, the TRM was not violated, and this issue was closed on 12/15/86 under plant procedures PT 13.4.28, PT 13.4.29 and PT 13.4.33. Design analysis DA-ME-97-081 provides the basis for current testing frequencies. | No further action required. | OK |

# Table C-2

## RG&E NFPA Code Compliance Summary Table for NFPA 13 - Installation of Automatic Sprinkler Systems, 1985 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-7 | Fire Department connection provided:<br>a. Pipe size not less than 4"<br>b. F.D. connection system side of check valve<br>c. F.D. connection identified (1" letters)<br>d. Approved check valve installed<br>e. Shutoff valve installed<br>f. Piping between check valve and outside hose coupling provided with auto drip valve<br>g. F.D. connection swivel fitting N.H. standard thread<br>h. Listed plugs or caps | One Fire Department connection provided at the north end of the Service Building. F.D. connection is in compliance with code. | No further action required. | OK |
| 2-9.2.1 | Pressure gages installed on riser of feed main near each test pipe (114" with shutoff) | Pressure gages installed on riser of feed main near each test pipe, 114" line with shutoff provided. | No further action required. | OK |
| 2-9.2.2 | Pressure gage of approved type, max. limit not less that 2x working pressure | Pressure gages are of approved type, with maximum limit not less than two times system working pressure. | No further action required. | OK |
| 3-9.1.1 | Test pipe of line diameter, smooth bore, corrosive resistant orifice, flow equivalent to (1) sprinkler | Impell identified that test pipes are provided, but are not identified by function.<br><br>A recommendation was made to provide signs on test pipe which identifies the function, including the system. However, signs are not required by the 1985 Ed. of NFPA 13, and the issue was closed on 12/15/86. | No further action required. | OK |
| 3-10.1.2 | Pipes protected from freezing (where necessary) | Test pipes protected from freezing where required. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 3-10.3.2 | Listed flexible pipe couplings (3 1/2" or larger) | Listed flexible pipe couplings provided on 3 1/2" or large lines. | No further action required. | OK |
| 3-11.1.1 | Sprinkler pipe capable of being drained | Sprinkler piping capable of being drained. | No further action required. | OK |
| 3-11.2.2 | Risers 4" or larger, 2" drains | Two inch drains are provided on sprinkler system with 4 inch or larger header piping. | No further action required. | OK |
| 3-11.3.4.2 | Draining of fire suppression systems not subject to freezing | Based on the 2015 Fire Protection FASA, the deluge systems (S15, S03, S04, and S01) that were approved to be converted to pre-action systems deviate from the NFPA13 drainage requirements. | ECP-15-000350 evaluated the acceptance of the compensatory proceduralized drainage for the pre-action systems. | OK |
| 3-11.4.4 | Drain pipes turned down elbow | All main drains are provided with turned down elbows. | No further action required. | OK |
| 3-11.4.5 | Drain pipes shall be arranged not to expose any part of system to freezing | Drain pipes do not drain to the exterior, systems are not exposed to freezing. | No further action required. | OK |
| 3-13.2 | Screwed unions not used on pipe larger than 2" | Screwed unions are not used on pipes larger than 2 inches. | No further action required. | OK |
| 3-14.1.1 | All valves on connections to water supply, shall be listed indicating valves | All valves on connections to water supplies are listed indicating valves. | No further action required. | OK |
| 3-14.1.2 | Drain and test valves listed (rated at 175 psi) | All drain and test valves are listed (and rated at 175 psi). | No further action required. | OK |
| 3-14.2.3 | Valves controlling sprinkler systems supervised | All valves controlling sprinkler systems are supervised. | No further action required. | OK |
| 3-14.2.4 | More than 1 source of water supply check valve provided | This section not applicable to Ginna. | No further action required. | OK |
| 3-14.3 | More than 1 control valve - permanently marked identification signs provided | In 1986, Impell identified that permanently marked identification signs were not provided for systems with more than one control valve. See recommendation for NFPA 26, Code Section 2-1 for the placement of identification and function control signs at each valve.<br><br>However, there is no system having more than one valve, and the functions of valves are identified in procedures. This was confirmed by D. Biedenbach on 10/16/86. As a result, this issue was closed. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 3-15.1.2 | Sprinkler piping and hangers supporting non-system components | In 1986, Impell identified that sprinkler piping in the TSC Diesel Generator was used to support a light fixture. A recommendation was made to remove the light fixture support brace from the sprinkler branch line.<br><br>As a result of the recommendation, the support brace was removed. This was confirmed by E. Mui on 10/14/86. As a result, this issue was closed. Walkdown by the Fire Protection Engineer on 7/25/03 confirmed that the light fixture is no longer supported off the fire water line. | No further action required. | OK |
| 3-16.2 | Only listed sprinklers installed | Sprinklers installed are listed and approved. | No further action required. | OK |
| 3-16.3.5 | Sprinklers not coated or painted | Sprinklers are not coated or painted. | No further action required. | OK |
| 3-16.7.1 | Spare sprinklers provided | Spare sprinklers are provided. | No further action required. | OK |
| 3-17.2 | Local waterflow alarms provided | Local water flow alarms are provided. | No further action required. | OK |
| 3-17.3.1 | Wet pipe - listed alarm check valve | Alarm control valves and check valves listed and approved. | No further action required. | OK |
| 5-.3.4 | Fire detector spacing (preaction, deluge) manufacture specifications | Fire detector spacing (preaction and deluge systems) is in accordance with manufacture specifications, and code requirements. | No further action required. | OK |
| 5-1 and 5-3 | Automatic sprinkler valves (all trim provided) Preaction and deluge valves required trim provided | Required trim provided for automatic sprinkler valves, preaction and deluge valves. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| Chapter 4 | Sprinkler spacing, location and position of sprinklers | In 1986, Impell confirmed that the spacing, location and position of sprinklers meet the requirements of the code. However, it was discovered that the baffles installed over the sprinkler heads of the Auxiliary Building stair protection sprinkler system have been pushed down on top of the sprinklers. This condition may effect the designed spray pattern, affecting the separation protection provided to the opening.<br><br>A recommendation was made to re-design the baffle/support to be more secure and prevent movement as required. However, it was confirmed by E. Mui (10/16/86) that all vertical sections of baffles are installed above sprinklers deflectors and consequently, spray pattern will not be affected. As a result, this issue was closed. | No further action required. | OK |

# Table C-3

## RG&E NFPA Code Compliance Summary Table for NFPA 14 - Standpipe and Hose Stations, 1983 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 1-8 | All devices and material of approved type | All devices (racks, valves, nozzles) are of approved type. | No further action required. | OK |
| 1-9 | Cabinets and closets (if applicable):<br>a. Sufficient size (1" between valve and cabinet)<br>b. Break glass device | The four occupancy hose cabinets at Ginna meet the requirements of this sections. | No further action required. | OK |
| 4-1.3 | Hose valves external threads of N.H. standard | Hose valve external threads are N.H. Standard. | No further action required. | OK |
| 4-2.1 | Approved hose valves provided | Approved hose valves are provided. | No further action required. | OK |
| 4-2.2 | Each hose valve having unlined hose, automatic drip connection provided | In 1986, Impell discovered that the four occupancy hose cabinets are not provided with approved automatic drip valves. A recommendation was made to install automatic drip valves on the four hose stations.<br><br>As valves are not required for lined hoses per the 1986 Ed. of NFPA 14, this issue was closed on 12/15/86. | No further action required. | OK |
| 4-4.2 | Valves approved indicating type, at main riser for controller branch lines | Approved valves (indicating type) provided at main risers for controlling branch lines. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 4-4.3.1 | Each hose station provided with not more than 100' of listed fire hose, 1-1/2" lined collapsible or non-collapsible fire hose | In 1986, Impell discovered that hose stations #3 and #5 have 125' of 1 1/2" non-listed hose. Other hose stations have between 75' and 100' of non-listed hose depending on location and area of protection. Code requires that hose stations be provided with a maximum of 100' of listed fire hose.<br><br>A recommendation was made to replace all existing hose with listed or approved non-collapsible fire hose with a maximum length of 100'. Existing hose does not provide the Fire Brigade with a usable standpipe hose system due to the lack of flexibility required for fire suppression activities in plant environments. Note that RG&E's approved technical requirements manual allows for 1 1/2" rubber hose not more than 125' in length. All plant hose reels were confirmed to have 100' lengths of 1 1/2" hose.<br><br>As a result of this recommendation, hose was replaced under plant procedure FPS-14. As a result, this issue was closed in 6/88. | No further action required. | OK |
| 4-4.3.2 | Listed rack or other approved storage facility | Racks and assemblies are listed and approved for fire service use. | No further action required. | OK |
| 4-4.3.4 | Each storage facility identified (fire hose for use by occupants) | Hose reels and stations are identified with signs. | No further action required. | OK |
| 4-7.1 | Pressure reducers provided | Section not applicable to Ginna. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 7-7.1 | Approved 3 1/2" dial spring pressure gage connected at the top of each standpipe | In 1986, Impell discovered that approved pressure gages (3 1/2" dial spring) are provided at the top of the risers in Containment only. Gages are not provided on other risers. A recommendation was made to install approved pressure gages (3 1/2" dial spring at the top of each riser.<br><br>A pressure gage is also installed on the hose reel riser on the top floor of the Intermediate Building cleanside based upon field walkdown by the Fire Protection Engineer.<br><br>Per a review of the Fire System P&IDs, it was confirmed that no other standpipe pressure gauges are installed, but this was determined to be acceptable since the risers are less than 60 feet high. | No further action required. | OK |
| 8-2 | Operability, maintenance and administrative procedure to verify operability of system | In 1986, Impell discovered, that operability and maintenance procedures meet the requirements of the code; each hose station is inspected in accordance with these requirements except the four occupancy use hose stations.<br><br>A recommendation was made to include the four occupancy use hose stations in the existing test and maintenance procedures.<br><br>As a result, procedures which test suppression systems S19 and S33 were revised by E. Mui and the issue was closed. Verification of this change was completed by the Fire Protection System Engineer. | No further action required. | OK |

# Table C-4

## RG&E NFPA Code Compliance Summary Table for NFPA 15 - Water Spray Fixed Systems, 1985 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-7 | Valves listed and approved type, shut-off or control of indicating type | Valves are listed and approved for fire service use. Shutoff or control valves are of the indicating type. | No further action required. | OK |
| 2-10 | Strainers installed, capable of continued operation without increase in head loss | Strainers are installed, and capable of continued operation without an increase in head loss. | No further action required. | OK |
| 2-10.2 | Pipeline strainers incorporate flushout connections | In 1986, Impell confirmed that flush connections are provided in strainer. However, flush connections are not piped to an adequate drain for flushing purposes.<br><br>A recommendation was made to install hose connections on drains to allow use of hose to floor drains as a suitable alternate to fixed piping.<br><br>As connections are not required by NFPA 15 (1985 Ed.), this issue was closed on 12/15/86. It should be noted that hoses are temporarily installed during flushing activities. | No further action required. | OK |
| 2-11.2 | Alarm actuated independently of water flow provided | Alarms are actuated independent of water flow. | No further action required. | OK |
| 2-13 | Suitable flushing connection provided for routine flushing | Flush connections are provided, see recommendation for Section 2-10.2 above, for means of routine flushing. | No further action required. | OK |
| 4-4.1.4 | Cable trays and cable runs, coverage provided on each tray or group of trays | Adequate coverage is provided on each tray or group of trays where protection is provided. | No further action required. | OK |
| 4-4.3.4 | Transformer protection provides complete impingement on exterior surfaces | Water spray protection for transformers provides complete impingement on exterior surfaces. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 4-6.2 | Adequate provisions to promptly and effectively dispose of all liquids | Provisions are provided to drain and dispose of all liquids from the fire area during operation of all fire systems in the fire area. Such provisions must be adequate for:<br>1. Water discharged from fixed fire protection systems at maximum flow conditions<br>2. Water likely discharged by hose streams.<br>3. Surface water<br>Recommendation: A typical company standard for substation installation is crushed stone to contain/control liquids. In addition to the crushed stone, an underdrain system is installed in the transformer yard which drains to a ponded area east of the plant.<br><br>Drainage is ensured as the collection pond was cleaned up in August 1986 under normal maintenance activities. This was confirmed by D. Biedenbach on 10/16/86. As a result, this issue was closed on 12/15/86. Existing plant procedures monitor the collection pond and ensure that it is available to perform its intended function. | No further action required. | OK |
| 4-7.1 | Shutoff valves readily accessible during a fire | Shutoff valves are readily accessible during fire conditions. | No further action required. | OK |
| 4-7.2 | Remote manual tripping devices conspicuously located and identified | Remote manual tripping devices are conspicuously located and identified. | No further action required. | OK |
| 4-9.2.5 | Provisions made for test gages at or near the highest or most remove nozzle | Provisions are provided for test gages at or near the highest or most remote nozzle. | No further action required. | OK |
| 4-11.1 | Main pipeline strainers provided for systems using nozzles with waterways less than 3/8" | Section not applicable to Ginna. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 6-1 | Operations and maintenance procedures to verify operability and maintain system in service. | In 1986, Impell discovered that testing and maintenance procedures meet the requirements of the code, except the frequency requirements for flow tests and nozzle inspection of open head spray systems. The code requires annual inspection frequencies. Ginna TRM frequency is every 3 years for flow test and 18 months for nozzle inspection.<br><br>A recommendation was made to maintain the Ginna TRM frequency requirements for these inspections. The existing frequency of inspection in the TRM (18 month nozzle inspection and 3 year flow test) were deemed adequate to determine system operability. Basis provided under DA-ME-97-081. As the TRM was not violated, this issue was closed. | No further action required. | OK |

# Table C-5

## RG&E NFPA Code Compliance Summary Table for NFPA 20 - Centrifugal Fire Pumps, 1983 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-2 | Fire pumps listed for fire protection service | Fire pumps are listed for fire protection service. | No further action required. | OK |
| 2-4 | Fire pumps provided with nameplate | Fire pumps are provided with the required name plates. | No further action required. | OK |
| 2-5 | Pressure gages provided:<br>a. 3 1/2" diameter<br>b. Rated working pressure 2x pressure | In 1986, Impell discovered pressure gages (0-200#) are provided on the discharge portion of the pumps. The code requires the gage be capable of indicating pressure of at least twice the rated working pressure of the pump. These gages should be replaced with 0-300# pressure gages.<br><br>A recommendation was made by Impell to replace the existing gages with 300# gages.<br><br>As a result of this recommendation, replacement gages were installed and confirmed by E. Mui on 12/13/86. As a result, this issue was closed. It should be noted that the Fire Protection Engineer confirmed the installation of 300# range gauges on 7/25/03. | No further action required. | OK |
| 2-6 | Circulation relief valve provided (3/4" automatic relief) | Circulation relief valve provided (3/4" automatic relief). | No further action required. | OK |
| 2-7.2 | Fire pump house maintained above $40^0$F | Fire pump house is maintained above 40˚F. | No further action required. | OK |
| 2-7.3 | Artificial lighting provided in pump house | Artificial lighting is provided throughout fire pump area. | No further action required. | OK |
| 2-7.4 | Emergency lighting provided | Emergency lighting is provided at the fire pumps and controller. | No further action required. | OK |
| 2-7.5 | Fire pump house adequately ventilated | Fire pump house is adequately ventilated. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-7.6 | Adequate floor drainage provided | Adequate fire drains are provided around fire pumps. | No further action required. | OK |
| 2-7.7 | Coupling guards provided | Coupling guards are provided to prevent rotating elements from causing injury to personnel. | No further action required. | OK |
| 2-9.7 | Control valves (listed OS&Y gate valves) provided | Listed control valves are provided. | No further action required. | OK |
| 2-9.8 | Double removable intake screens (suction intake) provide | In 1986, Impell discovered that the type of suction screening provided could not be determined from the drawings or questioning of plant personnel.<br><br>A recommendation was made to verify installation of the suction system screens.<br><br>As a result of this recommendation, the screens were verified by D. Biedenbach on 10/16/86. As a result of this verification, this issue was closed. It should be noted that both fire pumps were upgraded under PCR 2001-0038 and new strainers were provided in accordance with NFPA requirements. | No further action required. | OK |
| 2-10.4 | Listed check valves installed in pump discharge | Listed check valves are provided in the pump discharge piping. | No further action required. | OK |
| 2-10.5 | Listed indicating gate or butterfly valve installed on system side of check valve | Listed indicating gate valve is installed on the system side of the check valve. | No further action required. | OK |
| 2-11.1 | Clearance not less than 1" around pipes passing through walls | Clearance around pipes passing through walls is not less than 1 inch. | No further action required. | OK |
| 2-12.1 | Listed relief valves installed | Listed relief valves are installed in the system. | No further action required. | OK |
| 2-12.6 | Relief valve discharge into an open pipe or cone, water readily visible | Relief valves discharge into an open pipe, water is readily visible. | No further action required. | OK |
| 2-12.7 | Relief valves not piped to pump suction or supply | Relief valves are not piped to pump suction or supply. | No further action required. | OK |
| 2-13.1.1 | Water measuring device provided (pump test) | Water measuring test device provided (basement of Screenhouse). | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-13.2.1 | Metering device or fixed nozzles for pump test listed (175% of pump capacity) | Fixed nozzles for pump test are listed devices, capable of 175% of pump capacity. | No further action required. | OK |
| 2-13.3.1 | Hose valves shall be listed | Hose valves for fixed nozzles are listed device. | No further action required. | OK |
| 2-13.3.2 | Hose valves shall have NH Standard external threads | Hose valves have NH standard external thread. | No further action required. | OK |
| 2-13.3.3 | Listed indicating or butterfly gate valve, and drain or ball trip valve required where hose valve header located outside | Listed indicating type valves are provided, listed drain or ball drip valves are not provided.<br><br>However, proper maintenance and position verification of indicating isolation valve will be adequate to prevent freez-ing condition in this section of piping. | No further action required. | OK |
| 6-3.1.2 | Pump room wiring shall consist of rigid or liquid flexible metal conduit | All pump room wiring is in flexible metal conduit. | No further action required. | OK |
| 6-3.1.3 | Voltage at the motor shall not drop more than 5% below voltage rating of motor | Voltage at the motor does not drop more than 5% below the voltage rating of the motor. | No further action required. | OK |
| 6-3.1.4 | Voltage at controller inlet terminals shall not drop more than 15% below normal, under starting conditions | Voltage controller inlet terminals do not drop more than 15% below normal under starting conditions. | No further action required. | OK |
| 6-3.3 | Fire pump feeder connected ahead of all plant disconnecting means | Fire pump feeder connected ahead of plant disconnecting means. | No further action required. | OK |
| 6-3.4 | Means of disconnecting plant circuits from plant power shall not disconnect pump feeder circuits | Means of disconnecting plant circuits from plant power does not disconnect pump feeder circuits. | No further action required. | OK |
| 6-6.4 | Current-carrying parts of electric motors 12" above floor | Current carrying parts of the electric motor are maintained 12 inches above the floor. | No further action required. | OK |
| 7-1.1.1 | Controller listed for electric motor driven fire pump service | Controller is listed for electric motor driven fire pump ser-vice. | No further action required. | OK |
| 7-1.1.3 | Controller marked "Fire Pump Con-troller" | Controller identified "Fire Pump Controller." | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 7-2.1 | Controller located as close as practical to fire pump motor | In 1986, Impell discovered that the motor driven fire pump controller is located approximately 50' away from fire pump, while the code requires controller to be as close as practical to the pump.<br><br>However, due to the size of the area and adequate identification of the controller, the location meets the intent of the code. | No further action required. | OK |
| 7-2.3 | Current-carrying parts of controller 12" above floor | Current carrying parts of the controller are 12 inches above the floor. | No further action required. | OK |
| 7-3.4.2 | Provisions within controller to permit use of test instruments for measuring line voltage and currents without disconnecting any conductors | Provisions within the controller permit the use of test instruments for measuring the line voltage and currents without disconnecting any conductors. | No further action required. | OK |
| 7-3.4.4 | Controller not used as a junction box for other equipment | Controller is not used as a junction box for other equipment. | No further action required. | OK |
| 7-3.5 | Overcurrent protective devices shall not be connected to circuits required for operation | Current protection devices are not connected to circuits required for operation. | No further action required. | OK |
| 7-3.7.1 | Wiring diagram provided on inside of controller | Wiring diagrams are provided inside the controller. | No further action required. | OK |
| 7-3.8 | Motor control devices, switches, circuit breakers plainly marked | Motor control devices, switches and circuit breakers are clearly marked. | No further action required. | OK |
| 7-3.9 | Complete instructions provided, conspicuously mounted on controller | Instructions are provided on the front of the controller and conspicuously mounted. | No further action required. | OK |
| 7-4.1 | Isolating means:<br>a. Manually operable<br>b. Externally operable<br>c. Ampere rating 115% of nameplate current of motor | Isolating means provided meets the following requirements:<br>a. Manually operable<br>b. Externally operable<br>c. Ampere rating 115% of name plate current of motor. | No further action required. | OK |

| **CODE SECTION** | **SUMMARY OF REQUIREMENTS** | **FINDINGS/RECOMMENDATIONS** | **ACTION REQUIRED** | **STATUS** |
|---|---|---|---|---|
| 7-4.1.3 | Warning sign adjacent to isolating means:<br><br>"Warning - Do not open or close this switch while circuit breaker (Disconnecting Means) is in the closed position." | Warning signs adjacent to the isolating means "Warning - Do no open or close this switch while circuit breaker (Disconnecting Means) is in closed position." | No further action required. | OK |
| 7-4.1.4 | Isolating means handle, provided with spring latch | Isolating means handle provided with a spring latch. | No further action required. | OK |
| 7-4.2 | Circuits breaker (Disconnecting Means):<br>a. Externally operable<br>b. Trip free of handle<br>c. Nameplate provided with 3/8" high letters | Circuit breaker (disconnecting Means) meets the following requirements:<br>a. Externally operable<br>b. Trip free of handle<br>c. Name plate provided with 3/8" high letters. | No further action required. | OK |
| 7-4.5 | Pilot lamp provided | Pilot light indicating power is provided. | No further action required. | OK |
| 7-4.6 | Alarm and signal devices remote from controller provided:<br>a. Motor running<br>b. Loss of power<br>c. Phase reversed on line side of motor | Alarm and signal devices remote from the controller, annunciate in Control Room. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 7-5.2.1 | Water pressure control provided:<br>a. Connection between discharge check and discharge control valve<br>b. Line size 1/2" | Controller circuit provided with a pressure-actuated switch having independent high and low calibrated adjustments. This switch is responsible to water pressure in the fire protection system. Suitable provisions are provided for relieving pressure to the pressure-actuated switch, to allow testing of the operation of the controller and pumping unit.<br>• Each controller for multiple pump installation has individual pressure sensing line.<br>• Pressure sensing line connection for the control test line is between the pump discharge check valve and discharge control valve. Pressure sensing line for pressure auto start is before the check valve. Pressure sensing line shall be 1/2 inch nominal size, line provided is 1/4 inch.<br>However, as the pressure sensing line is performing its intended function in a satisfactory manner and does not affect the operability of the system; there is no reason to redesign. PCR 95-038 replaced the 1/4" diameter sensing line for the diesel fire pump, and the 1/4" sensing line for the motor fire pump was inspected in 2003 and determined to be acceptable by the Fire Protection Engineer. ECP-16-000342 disconnected and reconnected the line utilizing standard Swagelok connections. | No further action required. | OK |
| 7-5.2.4 | Sequential timing device provided | In 1986, Impell confirmed that a sequential timing device relay is provided in the diesel engineer fire pump controller which operates during drop in system pressure auto starts. However, it could not be determined from the wiring diagrams if the time delay relay functions during the auto start of the pumps from deluge system-trip.<br><br>A recommendation was made to verify that the sequential pump start delay relay also functions from a system actuation start signal.<br><br>As a result of the recommendation, the relay was Verified by D. Biedenbach on 10/16/86 and the issue was closed out. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 7-5.3.2 | Manual mechanical control at controller:<br>a. Means to mechanically latch handle<br>b. Handle moves one direction only | Manual mechanical control is provided at the controller meeting the following requirements:<br>a. Means to mechanically latch handle.<br>b. Handle moves in one direction only. | No further action required. | OK |
| 7-5.4 | Methods of stopping (2):<br>a. Manual<br>b. Automatic | Two methods of stopping the pumps are provided:<br>a. Manual (push button)<br>b. Automatic (7 minute timer) | No further action required. | OK |
| 7-8 | Transfer switch for emergency power supply provided:<br>a. Automatic transfer switch | Section not applicable to Ginna Station. | No further action required. | OK |
| 8-2.1 | Diesel engine listed | Diesel engine listed for fire service use. | No further action required. | OK |
| 8-2.4.1 | Governor provided | Governor is provided. | No further action required. | OK |
| 8-2.4.2 | Overspeed device provided (205) above rated speed | Overspeed protection (120%) device provided. | No further action required. | OK |
| 8-2.4.3 | Tachometer provided | Tachometer is provided. | No further action required. | OK |
| 8-2.4.4 | Oil pressure gage provided | Oil pressure gage provided. | No further action required. | OK |
| 8-2.4.5 | Temperature gage provided | Temperature gage provided. | No further action required. | OK |
| 8-2.4.6 | Instrument panel | Engine instruments are placed on a suitable panel secure to the engine. | No further action required. | OK |
| 8-2.5.2 | Electric starting device | Electric starting device provided. | No further action required. | OK |
| 8-2.6 | Two storage battery units provided | Two storage battery units provided. | No further action required. | OK |
| 8-2.6.4 | Charger specifically listed for fire pump service | Battery charger provided is specifically listed for fire pump service. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 8-2.6.5 | Storage batteries rack supported | Storage batteries are rack supported above the floor and located where they will not be subject to excessive temperature, vibration, mechanical injury, or flooding with water. They are readily accessible for servicing. | No further action required. | OK |
| 8-2.7.1 | Coolant circulation closed type:<br>a. Circulating pump<br>b. Heat exchanger<br>c. Engine jacket temp. regulator<br>d. Means of checking coolant level (makeup) | Closed type coolant circulation system is provided including the following:<br>a. Circulation pump<br>b. Heat exchanger<br>c. Engine jacket temp. reg.<br>d. Means of coolant level checks System is provided with a backup supply | No further action required. | OK |
| 8-2.7.2 | Exchange waste supply from discharge of pump | Exchange waste supply is from the discharge side of the pump. | No further action required. | OK |
| 8-2.7.3 | Bypass line (manual valve, flush type strainer) provided | Bypass line (manual valve, flush type strainer) is provided. | No further action required. | OK |
| 8-2.7.4 | Waste line provided | Waste line is provided. | No further action required. | OK |
| 8-2.7.5 | Provisions for exhaust manifold provided to avoid hazard to operator | Provisions to avoid hazard to operator for the exhaust manifold are provided. | No further action required. | OK |
| 8-3.1 | Pump room drainage provided | Adequate drains are provided throughout the fire pump area. | No further action required. | OK |
| 8-4.2 | Fuel tank capacity equal to 1 gallon per hp + 10% | Fuel tank supply capacity adequate to support an 8 hour operation of the diesel fire pump. (minimum) | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 8-4.5 | Diesel fuel tanks located above ground:<br>a. Supply line per code<br>b. Means other than sight tube provided<br>c. Suitable fill, drain and vent provided | Diesel fuel tank is located above ground; the fuel supply line to the engine meets the requirements of the code. Means of determining the amount of fuel in the storage tank other than a sight tube should be provided. the tank is provided with a suitable fill, drain and vent connection.<br><br>In 1986, Impell recommended the installation of a storage tank level indication device to provide indication through audible or visual alarm of low fuel level in the tank.<br><br>As this code was not committed and the tank is provided with visual level indication on the top of the tank, this issue was closed on 12/15/86. | No further action required. | OK |
| 8-4.6 | No shutoff valve in fuel line return | Shutoff valve is not provided in the fuel line return. | No further action required. | OK |
| 8-5.2 | Exhaust from engine pipe to a safe location | Exhaust from engine is piped to a safe location at the exterior of the building. | No further action required. | OK |
| 8-5.3 | Seamless or welded flexible connection between exhaust outlet and pipe | The engine exhaust system is designed per code requirements. | No further action required. | OK |
| 8-6 | Operations and maintenance procedures in place:<br>a. Weekly run (30 minutes)<br>b. Fuel supply maintenance<br>c. Engine maintenance<br>d. Battery maintenance | Operations and maintenance procedures are in place that perform the following:<br>a. Weekly run test, 30 minute auto timer (Tuesdays)<br>b. Fuel supply verification<br>c. Engine maintenance<br>d. Battery maintenance | No further action required. | OK |
| 9-1.2 | Controller listed for diesel driven fire pumps | Controller (King Knight) is listed and approved for diesel driven fire pumps. Controller replaced with a listed Firetrol panel under PCR 95-038. The controller was replaced with with a listed Firetrol panel under ECP-16-000342. | No further action required. | OK |
| 9-1.4 | Controller located as close as practical to pump engine | Controller located in as close as possible to the pump. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 9-3.4 | All cabinets are locked | In 1986, Impell discovered that the controller cabinet was not provided with a locking mechanism. All switches required to keep the controller in the "automatic" position shall be within a locked cabinet<br><br>An evaluation was performed under Condition Report CR-2007-000201 which determined that the intent of the code was met since:<br>a. The controller panel is located in the protected area;<br>b. The controller panel is located in a vital area; and<br>c. All switches in the cabinet are supervised by alarms. The above items prevent malicious and unauthorized manipulation of controller functions. | No further action required. | OK |
| 9-3.6 | Wiring diagrams and instructions provided | Wiring diagram and instructions are provided on the inside of the cabinet. | No further action required. | OK |
| 9-4.1 | Alarm and signal devices on controller:<br>a. Pilot lamp (controller in automatic)<br>b. Low oil pressure<br>c. High engine jacket cooler<br>d. Failure to start<br>e. Shutdown from overspeed<br>f. Battery failure (each bank) | The following alarm and signal devices are provided on the controller, and meet the requirements of the code:<br>a. Pilot lamp (controller in automatic)<br>b. Low oil pressure<br>c. High engine jacket cooler<br>d. Failure to start<br>e. Shutdown from overspeed (1205)<br>f. Battery failure (each bank) | No further action required. | OK |
| 9-4.1.3 | No available alarm silencing switch (other than main switch) provided | Alarm silencing switch other than the main switch is not provided. | No further action required. | OK |
| 9-4.2 | Alarms and signal device remote from controller:<br>a. Engine running<br>b. Controller main switch off<br>c. Trouble on the controller or engine | Alarm and signal devices are provided in the control room (remote from the controller) for the following:<br>a. Engine running<br>b. Controller main switch off<br>c. Trouble signal from the controller. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 9-4.3 | Controller equipped with contacts to operate circuits for alarms in 9-4.2 | Controller is equipped with contacts to operate circuits for alarms indicated in 9-4.2. | No further action required. | OK |
| 9-5.1 | Automatic controller shall be operable as non-automatic | Automatic controller can also be operable as non-automatic. | No further action required. | OK |
| 9-5.2.1 | Water pressure control switch:<br>a. Pressure sensing line between discharge check and control<br>b. 1/2" size | The pressure sensing line connection for controller test line is between pump discharge check valve and control valve. Pressure sensing line connection for pump auto start is before the check valve. Pressure sensing line shall be 1/2 inch nominal size. In 1986, Impell discovered that the line provided is 1/4 inch.<br><br>A recommendation was made by Impell to leave as is, as the pressure sensing line is performing its intended function in a satisfactory manner and does not affect the operability of the system. As a result, this issue was closed. PCR 95-038 replaced the 1/4" diameter sensing line for the diesel fire pump, and the 1/4" sensing line for the motor fire pump was inspected in 2003 and determined to be acceptable by the Fire Protection Engineer. ECP-16-000342 disconnected and reconnected the line utilizing standard Swagelok connections. | No further action required. | OK |
| 9-5.2.4 | Sequence starting of pumps provided | Sequential starting time delay relay is provided within the starting logic of the controller. | No further action required. | OK |
| 9-5.2.7 | Weekly program timer provided (30 minutes weekly run test) | Weekly program timer provided, 30 minute weekly run test. No further action required. | No further action required. | OK |
| 9-5.3.1 | Manual electric control of controller | Manual electric control of controller is provided. | No further action required. | OK |
| 9-5.3.2 | Starting equipment arrangement:<br>a. 2 storage batteries<br>b. Attempt to start cycle<br>c. Missing or inoperable battery lockout | Starting equipment arrangement provided per the code for the following:<br>a. Two storage batteries<br>b. Attempt to start cycle<br>c. Missing or inoperable battery lockout | No further action required. | OK |
| 9-5.4.1 | Methods of stopping:<br>a. Manual shutdown (selector switch, stop button) | Manual shutdown can be accomplished by the operation of the selector switch on controller panel, and the operation of a stop button on the outside of the controller. | No further action required. | OK |

| **CODE SECTION** | **SUMMARY OF REQUIREMENTS** | **FINDINGS/RECOMMENDATIONS** | **ACTION REQUIRED** | **STATUS** |
|---|---|---|---|---|
| 9-5.4.2 | Automatic shutdown after auto-start:<br>a. Emergency overspeed gov. | The controller is equipped for automatic engine shutdown after starting causes have been returned to normal. A running period time set for at least 30 minutes is used. The controller is provided with an overspeed governor shutdown which will cause the engine to shutdown without a time delay, and lock out until manually reset. | No further action required. | OK |
| 11-3 | Operations and maintenance procedures:<br>a. Annual fire pump test<br>b. Weekly test<br>c. Annual controller test | Operations and maintenance procedures are in place which provide the following:<br>a. Annual fire pump test<br>b. Weekly test, automatic timer (30 minute run)<br>c. Annual controller functional test | No further action required. | OK |

# Table C-6

## RG&E NFPA Code Compliance Summary Table for NFPA 24 - Private Fire Service Mains and Their Appurtenances, 1984 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-2.3 | Mains 6" or larger | Ontario Water District provides water supply to the underground fire main and hydrant system. Supply enters the site at the main entrance and utilizes 6 inch size piping. | No further action required. | OK |
| 3-3 | Connections to buildings provided with listed indicating valves | Connection of the Screenhouse sprinkler system from the fire service main is provided with a listed Post Indication Valve (#9204). Connection of the fire service main to the misc. structures located on site are provided with listed P.I.V.s except for the Receiving Building, which has an underground curb valve. Note: This water supply line is used for domestic water only. | No further action required. | OK |
| 3-3.2 | Post indicating valves located not closer than 40' to buildings | Post indicating valves are located more than 40' from buildings. | No further action required. | OK |
| 3-3.4 | Post indicating valves properly protected from damage | Post indicating valves are properly protected against mechanical damage where necessary. | No further action required. | OK |
| 3-6 | Valves identified by unique number, function and systems they control | In 1986, Impell discovered that the post indicating valves and the underground control valves do not have identification signs, or signs indicating their function including what they control.<br><br>A recommendation was made by Impell to provide permanent signs at each valve, which identifies the valve (number or letter designation) and also details its function including portions of the underground system or fire protection systems controlled.<br><br>Despite the code not being committed, signs were provided and each valve was provided with a unique valve EIN. | No further action required. | OK |
| 4-1.1 | Hydrants of approved type with not less than 6" connection from main. Valve installed in hydrant connection | Hydrants are of an approved type with 6 inch connection to the mains. Hydrant curb valves are installed at the hydrant connection. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 4-1.2 | Hydrant outlet threads NH Standard | Hydrant outlet external threads (N.H. Standard), are provided and compatible with the Ontario Fire Department. | No further action required. | OK |
| 4-2.2 | Hydrants placed 40' from buildings | In 1986, Impell verified that all hydrants are located 40' from buildings. However, wall hydrants #5516 and #5158 (Diesel Generator and Service Building), which were not required by NFPA 24 when installed, were installed per NFPA 13 and 14 which allowed a minimum 4 inch line.<br><br>A recommendation was made by Impell to perform an analysis on the affects of the 4 inch supply line provided in relationship to the 6 inch supply line required. The wall hydrants are designated as a backup means of supply for fire protection systems in the event of a loss of plant fire service water.<br><br>As this code was not committed, this issue was closed on 12/15/86. Design Analysis DA-ME-2000-0001 documents the capability of the yard loop when it is cross-tied to the plant fire system. | No further action required. | OK |
| 4-3.6 | Operations and maintenance procedure to verify hydrant operability | Operations and maintenance procedures are in place to verify operability and perform maintenance. | No further action required. | OK |
| 5-1 | Adequate supply of hose and equipment provided | Adequate supply of hose is provided. | No further action required. | OK |
| 5-2.1 | Hose houses located near hydrants | Hose houses are located near hydrants. | No further action required. | OK |
| 5-3 | Hose houses substantially constructed | In 1986, Impell discovered that hose houses are not substantially constructed or supported.<br><br>A recommendation was made by Impell to replace old hose stations with new ones.<br><br>As a result of the recommendation, the hose houses were replaced, based on field walkdowns in 1999 by the Fire Protection Engineer, despite the code not being committed. This issue was closed in 7/90. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 5-5 | Hose houses plainly identified | Hose houses are plainly identified. | No further action required. | OK |
| 5-6 | General Equipment:<br>a. 2 - Approved adjustable spray-solid stream nozzles with shutoffs for each<br>b. 1 - Fire ax with brackets<br>c. 1 - Hydrant wrench<br>d. 4 - Coupling spanners for each site hose<br>e. 2 - Hose coupling gaskets for each size hose<br>f. Reducers or gated wyes | In 1986, Impell discovered that the hose houses are deficient in the following equipment from the recommended general equipment list:<br>a. 1 adjustable spray - solid stream nozzle<br>b. 2 - 2 1/2" coupling spanners<br>c. 2 - 1 1/2" coupling spanners<br>d. Fire ax with brackets<br>A recommendation was made by Impell to evaluate the Fire Brigade needs and determine if additional equipment is required for Fire Brigade operations. As the equipment provided in the hose stations is in accordance with subsection 3.1.26 of the SER and the code is not committed, this issue was closed out on 12/15/86. | No further action required. | OK |
| 5-7 | Domestic service use prohibited | Domestic use of the fire service water systems is prohibited without special permission. | No further action required. | OK |
| 8-1 | Underground main cover required (4 1/2' recommended, 3' under roadways, 4' under R.R. tracks) | Ground coverage of the underground main system is adequate. | No further action required. | OK |
| 8-3.1 | Pipes shall not run under buildings | Fire service water piping does not run under buildings. Yard loop piping was routed around the Engineering building addition and between the "seven wide" trailer area. | No further action required. | OK |
| 8-3.5 | Pipes shall not be used for grounding of electrical service | Fire service water piping is not used for grounding of electrical service. | No further action required. | OK |
| 8-6 | Fire mains adequately anchored (trust blocks or tie rods) per Code | Based on discussions with site personnel, fire mains are adequately anchored. | No further action required. | OK |

# Table C-7

## RG&E NFPA Code Compliance Summary Table for NFPA 26 - Supervision of Valves Controlling Water Supplies for Fire Protection, 1983 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-1 | Identification signs provided at each valve, including valve function | In 1986, Impell discovered that identification and system function signs are provided for suppression system control valves, except for charcoal filter 1G. Isolation control valves throughout the system are identified by there unique identification number but the valve function is not provided. The control valves in the domestic water main system supplied by the Ontario Water District are not identified or their functions provided.<br><br>A recommendation was made by Impell to identify all valves (P.I.V., OS&Y and underground type) with their unique means of identification (number or letter). All fire system valves (domestic system and plant fire water system) should have a sign permanently attached detailing their function including the portions of the main, suppression systems and hydrants which may be affected by opening or closing that particular valve. Impell identified that this could be accomplished through the use of a drawing highlighting the valve in question and areas affected by its operation.<br><br>Despite the code not being committed, P&IDs were reconstituted under EWR 3391, all valves were provided with unique EINs, and the issue was closed in 7/92 | No further action required. | OK |

| **CODE SECTION** | **SUMMARY OF REQUIREMENTS** | **FINDINGS/RECOMMENDATIONS** | **ACTION REQUIRED** | **STATUS** |
|---|---|---|---|---|
| 3-1 | Administrative procedures in place to verify position and operability of each valve | The code requires that a systematic weekly inspection (or monthly in the case of locked open valves) of each valve should be made and a report form used to record the condition of each valve. The following inspection procedures are in place at Ginna:<br>1. PT-13.17 "Valve Tamper Switches" - this procedure verifies the operability of the tamper switches on a 6 month frequency. There are no provisions to inspect these valves as required by the code.<br>2. PT-13 "Fire Pump Operation and System Alignment" - this procedure tests the automatic fire protection system valves monthly and a system check of all values not monitored in the Control Room. Code compliance is met for the valves inspected per this procedure.<br>3. PT-13.9 "Fire System Valve Cycling" - this procedure provides for the cycling of all valves in the fire system flow path. This meets the requirement of the code. However, in 1986 Impell discovered that the following valves are not listed on the applicable test procedures: | | OK |

| **CODE SECTION** | **SUMMARY OF REQUIREMENTS** | **FINDINGS/RECOMMENDATIONS** | **ACTION REQUIRED** | **STATUS** |
|---|---|---|---|---|
| 3-1 (cont.) | | a. #9247 - 4" isolation valve to 1G charcoal filter system deluge valve (included on Aux bench board)<br>b. #9566 - 2 1/2" isolation valve to hose reel 32 (locked open)<br>c. #9276 - 4" isolation valve to two hose cabinets in TSC (included in PT-13.17)<br>d. #9282 - 2" isolation valve to TSC sprinkler system (included in PT-13.17)<br>e. #9279 - 3" isolation valve to TSC charcoal filter (included in PT-13.17)<br>f. #5210 - supervised valve included in PT-13<br>g. #5204 - Supervised valve included in PT-13<br>h. #5205 - Supervised valve included in PT-13<br>i. #5206 - Supervised valve included in PT-13<br>J. #5207A - Supervised valve included in PT-13<br>k. All valves in the domestic fire water system<br><br>A recommendation was made by Impell to perform an analysis to identify all valves controlling supplies for fire protection, revise procedures to ensure all valves are inspected monthly to verify condition and position and to ensure all valves are cycled (if accessible) on an annual basis. This analysis should include the Ontario Water System also.<br><br>As a result of the recommendation, procedure PT-13 - PCN was completed 5/90 for all valves and procedure FPS-5 was developed to cover Ontario Water Supply System 3/20/90. This issue was closed out on 5/19/90. However, not all of the valves listed above are covered by these procedures. Review of PT-13 and PT-13.17 on 7/24/03 confirmed valves noted above. Review of procedure FPS-5 on 7/24/03 confirmed all yard loop valves are included. | | |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 6-1 | Supervision of valves, approved method utilized | All valves controlling water supplies for fire protection should be supervised. Ginna utilizes primarily 3 methods: proprietary (tamper switch) supervisory service - approximately 75% of the valves use this method of supervision, locking valves in their required position, and the sealing of valves (PIVs in the Ontario Water System). In 1986, Impell discovered that the following valves have no form of supervision:<br>1. 5155 - wall hydrant (Aux. Bldg. East)<br>2. 5156 - wall hydrant (Diesel Room North)<br>3. 5158 - wall hydrant (Service Bldg. West)<br>4. 5157 - wall hydrant (Turbine Bldg.)<br>5. Diesel and motor driven fire pump test lines<br>6. All underground valves in the domestic water system<br>A recommendation was made by Impell to perform an analysis of all valves controlling water to fire protection systems or portions of the fire protection water system. All valves under review should be either locked in their required position or provided with valve tamper switches which signal is generated to a constantly manned station. Inspection procedures should concurrently be developed and revised to be in compliance with Section 3-1 above.<br><br>As this code was not committed, this issue was closed on 12/15/86 | No further action required. | OK |
| 6-2 | If locked supervision provided the control and distribution of keys shall be under the authority of responsible personnel | The distribution of keys to the locked valves in the fire system are the responsibility and control of the Shift Supervisor. The procedure currently in place to control the distribution and use of keys is in compliance with this code. | No further action required. | OK |

# Table C-8

## RG&E NFPA Code Compliance Summary Table for NFPA 37 - Stationary Combustible Engines and Gas Turbines, 1984 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-1.1.22 | Provisions for venting are adequate to prevent accumulation of flammable vapors:<br>a. Openings in Engine Room provided with automatic or self-closing doors or dampers | Provisions for adequate venting to prevent the accumulation of flammable vapors are provided in rooms containing stationary combustion engines.<br><br>Openings in the rooms are provided with automatic or self-closing doors and dampers. However, it was discovered that all penetrations are sealed except for the TSC Diesel Generator Room.<br><br>A recommendation was made by Impell to install penetration seals in the TSC Diesel Generator Room that are equivalent to the rating of the fire barrier.<br><br>As a result of the recommendation, penetration seals were installed in the TSC Generator Room in 12/87 and validated under EWR 4941. | No further action required. | OK |
| 2-1.2 | Emergency lighting provided | Emergency lighting is provided in the Standby Diesel Generator Rooms. However, it was discovered by Impell in 1986 that emergency lighting is not installed in the Security Diesel Room or the TSC Diesel Room.<br><br>A recommendation was made to install emergency lighting in the Security and TSC Diesel Rooms.<br><br>As a result of this recommendation, emergency lighting was installed in TSC Diesel Room and Security Diesel Room and verified by E. Mui 10/15/86. As a result, this issue was closed. It should be noted that the Fire Protection Engineer confirmed the installation of E-lights in both of these rooms via walkdown and review of the fire response plan drawings for both rooms. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-1.3 | Engines situated accessible for maintenance, repair and firefighting operations | Engines are situated so that they are readily accessible for maintenance, repair and fire fighting. | No further action required. | OK |
| 2-1.4 | Provisions to supply sufficient air for combustion, cooling and venting | Provisions to supply sufficient air for combustion, cooling and venting are provided. | No further action required. | OK |
| 2-1.5 | Combustible materials | Rooms are clear of combustible materials during normal operations. | No further action required. | OK |
| 3-3.1 | Engine protection provided:<br>a. Automatic engine shutdown (overspeed protection)<br>b. Automatic shutdown high lubricating oil temp.<br>c. Remote engine shutdown<br>d. Means of shutting off fuel supply<br>e. Remote means of shutting down lube oil pumps | Engine protection provided.<br>a. Automatic engine shutdown (overspeed)<br>b. Automatic shutdown - high lubricating oil temperature<br>c. Remote engine shutdown<br>d. Means of shutting down lube oil pumps (where applicable) | No further action required. | OK |
| 4-1.2 | Plastic pipe shall not be used | Plastic pipe is not used. | No further action required. | OK |
| 5-1.1 | Day tanks of constructed steel with welded joints | Day tanks are constructed of steel with welded joints. | No further action required. | OK |
| 5-3.5 | Unenclosed day tanks and supply tanks do not exceed 660 gallons | Unenclosed day tanks and supply tanks do not exceed 660 gallons. | No further action required. | OK |
| 5-3.8 | Day tanks of constructed steel with welded joints | Day tanks are securely mounted on non-combustible supports. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 5-4.1 | Liquid fuel supply systems, including drains from carburetors designed to minimize accidental discharge:<br>a. Adequate alarms, float controlled valves or protective sight glass provided<br>b. Stationary powered fuel pumps supply day tanks have stop controls (high tank level) | The liquid fuel supply systems, including drains from carburetors are designed to minimize accidental discharge through:<br>a. Adequate alarms, float controlled valves and protective sight glasses.<br>b. Stationary powered fuel pumps supplying day tanks have stop controls (high tank level) | No further action required. | OK |
| 5-4.2 | Day tanks provided with overflow, high level alarm, auto shutoff | Day tanks are provided with overflow high level alarms and auto shutoffs as required by Code. It appears that the alarms and controls for the TSC Diesel have been removed or never installed.<br><br>A recommendation was made by Impell to verify that overflow high level alarms and auto shutoffs are provided and function as required.<br><br>As this code was not committed, this issue was closed on 12/15/86. | No further action required. | OK |
| 5-4.3 | Overflow, vents and fuel piping located near engineer air intake, exhaust piping or mufflers | Overflow, vents and fuel piping are not located near engine air intake, exhaust piping or mufflers. | No further action required. | OK |
| 5-6.1 | Vent piping for day tank provided | Vent piping for day tanks are provided. | No further action required. | OK |
| 5-7.2 | Piping system substantially supported, protected against physical damage and stress | Piping systems are substantially supported and protected against physical damage and stress. | No further action required. | OK |
| 5-7.3 | Sufficient valves provided to control flow of liquid | Sufficient valves are provided to control the flow of fuel in normal operations and to shut off the flow of fuel in the event of a pipe break. | No further action required. | OK |
| 5-8.1 | Liquid fuel feeds to engines from pumps only | Fuel feeds to engines for pumps only. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 6-1.4 | Provisions made in exhaust system to prevent damage resulting from ignition | Exhaust systems are designed to prevent damage resulting from ignition of unburned fuel. | No further action required. | OK |
| 7-1.1 | Crankcase or oil reservoir vented | Crank case or oil reservoir are adequately vented. | No further action required. | OK |
| 8-1.1 | Instructions for starting, stopping operation and routine maintenance provided, if feasible conspicuously posted | Instructions for starting and stopping operations are conspicuously posted. Procedure to provide routine maintenance are provided. | No further action required | OK |

# Table C-9

## RG&E NFPA Code Compliance Summary Table for NFPA 72D - Proprietary Protective Signaling Systems, 1986 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-2.2 | All equipment listed for fire protection service | Detection equipment utilized is listed for fire protection service. | No further action required. | OK |
| 2-4 | Operability, maintenance and administrative procedures in place | Operability, maintenance and administrative procedures are in place and meet requirements identified in the Code. | No further action required. | OK |
| 2-6.2 | Power supply A (primary/secondary):<br>a. Standby 24 hour supply | Primary and secondary power supplies are provided to satellite station A, B and C. The secondary power supplies are storage batteries with 4 hour capacities. This meets Section 2-6.2.3.<br><br>The secondary (standby) supply shall be capable of operating the system under normal traffic conditions for 24 hours. The secondary (standby) power supply shall consist of one of the following:<br>a. A storage battery with a 24 hour capacity; or<br>b. An engine driven generator and storage batteries with a 4 hour capacity; or<br>c. Multiple engine-driven generators<br>The primary power supply to the satellite stations has a high degree of reliability, and adequate capacity for the intended service. The primary power supply is backed up by the standby diesel generators and the secondary supply (4 hour storage batteries). The design and reliability of the primary and standby power sources exceeds the intent implied for power supplies as defined in the Code. | No further action required. | OK |
| 3-3 | Manual fire alarm station:<br>a. Placement (spacing)<br>b. Wall height (3 1/2" to 5') | Manual fire alarms stations provided and meet the requirements of the Code. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 3-5.12 | Integral trouble contacts wired on initiating device circuit (trouble alarm does not impair other alarms) | Automatic fire detectors which have integral trouble contacts are wired on the initiating device circuit so that a trouble contact on one contact will not impair the alarm operation from other initiating devices. | No further action required. | OK |
| 3-6 | Sprinkler system water flow and supervisory signals supervised | Sprinkler system water flow and supervisory signals are supervised. | No further action required. | OK |
| 4-3 | Trouble signals (distinctive audible signal) | Audible trouble signals are distinctive from fire alarm signals. Trouble and supervisory audible signals are the same. | No further action required. | OK |
| 4-3.2 | Trouble silencing switch | Trouble silencing switches on control stations are per Code. Silencing the audible trouble signal transfers the trouble indication to a lamp. | No further action required. | OK |
| 4-4 | Distinctive signals:<br>a. Fire alarm from trouble and supervisory alarms<br>b. Supervisory from others | Audible trouble signals are distinctive from fire alarm signals. Trouble and supervisory audible signals are the same. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 4-5 | System operation (signal receipt):<br>a. Recorded<br>b. Audible | System operation (signal receipt) shall consist of a recording device which shall indicate change of status all of signals received at the central supervising station automatically, and provide a permanent record including time and date of occurrence. In 1986, it was discovered by Impell that a method of permanently recording alarms is not provided at the central supervising station. In addition, different means, one of which shall be audible, for alerting the operator when each signal is received indicating a change of state of any initiating device circuit.<br><br>A recommendation was made to provide a means of automatically and permanently recording alarms. Even though the control room is constantly manned with procedures in place to access alarms, there is no way to verify sequence of events with regard to first detector alarms, second detection alarms and system actuations. during the Code Compliance Review, there were several fire detection and system inadvertent actuation. In these cases, there were no definite records maintained to indicate exact system happenings. The control room is a busy area with effort placed on fire protection concerns (trouble and supervisory alarms) not always maintained as required.<br><br>It was confirmed that the NRC accepted not having alarm recording capability as documented in NRC correspondence RG001680, dated 2/14/79, Section 4.2. | No further action required. | OK |
| 4-5.3 | System operation (signal receipt):<br>a. Recorded<br>b. Audible | All alarms are received or displayed within the maximum allowable time lapse (90 seconds) for sensing a fire at the initiating device. | No further action required. | OK |
| 4-6 | Transmitter fault, trouble conditions affect or delay signals | Trouble conditions in a leg facility do not affect or delay receipt of signals to the central supervising station from other leg facilities on the same truck facility. | No further action required. | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 4-7 | Signal report and disposition (alarms, supervisory, trouble) Automatic fire detectors:<br>a. All detectors listed<br>b. Location and spacing of detectors (based on type and hazard)<br>c. Special application detectors<br>d. Administrative, operability and maintenance procedures in place | Alarms are assessed by control room personnel and depending on the type of alarm the Fire Brigade is activated to provide assessment support to the control room. Trouble and supervisory signals are also immediately assessed with the appropriate personnel notified. The intent of the code is met or exceeded by the actions required for signal reports and disposition. | No further action required. | OK |

# Table C-10

## RG&E NFPA Code Compliance Summary Table for NFPA 72E - Automatic Fire Detection, 1984 Ed.

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-5.1 | All fire detection devices listed or approved for purpose for which they are intended. | All fire detection devices are listed or approved for the purpose for which they are intended. | No further action required. | OK |
| 2-6 | Location and spacing of detectors | The location and spacing of detectors shall result from an evaluation based on engineering judgment supplemented by guidelines detailed in the standard, i.e., ceiling shapes and surfaces, ceiling heights, configuration of contents, burning characteristics of material present and ventilation and air flows present in the affected area. Where the intent of the detector is to protect a specific hazard, the detector(s) may be installed closer to the hazard in a position where the detector will intercept smoke, as in the case throughout the plant where specific equipment is protected. The installation of detectors (smoke) meets the intent of the code for area and specific component protection. Detector spacing and location can be justified through engineering analysis performed by RG&E. The only area of concern is the installation of the 8 ionization detectors around the operating level of the containment structure. These detectors do not meet the requirements of area protection, and are not providing protection to specific equipment. The Tech. Specs. list these detectors as area detection. | | OK |

| CODE SECTION | SUMMARY OF REQUIREMENTS | FINDINGS/RECOMMENDATIONS | ACTION REQUIRED | STATUS |
|---|---|---|---|---|
| 2-6 (cont.) | | A recommendation was made by Impell to perform an analysis on the effectiveness of the detectors as area protection; which should include ventilation and an air flow test. The possibility of removing the detectors from the Tech. Specs. and the effects of removing the detectors in relationship to protection provided in containment should also be evaluated.<br><br>The number of detectors in certain areas of the plant far outnumber the amount required by the Code, and Standard Manufacturer Requirements. An analysis should be performed to determine the actual required number of detectors. This will provide greater flexibility with regards to Tech. Specs. detection operability requirements.<br><br>Despite the code not being committed, an analysis was performed and the issue was closed by Electrical Engineering (B. Hunn). Design Analysis DA-ME-2000-052 was prepared to document the acceptability of the installed detection systems. | No further action required. | |

# Non Power Operations Table

(Reference: 0028-0011-008-001, R.E. Ginna Non-Power Operation Upgrade)

| Fire Area/Zone | Recommended Actions to Manage Fire Risk |
|---|---|
| ABBM/ABB | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| ABBM/ABM | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| ABI/ABO | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| ABI/IBN-1 | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| BOP/SB-1 | In the area of the stock room and the corridor between the stock room and rolling fire door F20, limit the hot work and/or prohibit transient combustible storage, and/or provide a continuous or periodic fire watch specifically. F20 is between the Service Building and the Turbine Building. |
| BOP/TB-1 | Limit hot work and/or verify that the available fire detection systems located in the fire zone are functional (post fire watch prior to entering HRE conditions if system(s) are impaired), and/or limit transient combustible storage in this fire zone. |
| BOP/TB-2 | Limit hot work and/or verify that the available fire detection systems located in the fire zone are functional (post fire watch prior to entering HRE conditions if system(s) are impaired), and/or limit transient combustible storage in this fire zone. |
| BOP/TSC-1M | Limit hot work and/or verify that the available fire detection systems located in the fire zone are functional (post fire watch prior to entering HRE conditions if system(s) are impaired), and/or limit transient combustible storage in this fire zone. |

# Non Power Operations Table

| Fire Area/Zone | Recommended Actions to Manage Fire Risk |
|---|---|
| BOP/TSC-1N | Limit hot work and/or verify that the available fire detection systems located in the fire zone are functional (post fire watch prior to entering HRE conditions if system(s) are impaired), and/or limit transient combustible storage in this fire zone. |
| BOP/TSC-1S | Limit hot work and/or verify that the available fire detection systems located in the fire zone are functional (post fire watch prior to entering HRE conditions if system(s) are impaired), and/or limit transient combustible storage in this fire zone. |
| BR1A | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| BR1B | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| CC/AHR | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| CC/RR | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| CC/CR | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| CHG | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| CT | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| EDG1A | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |

# Non Power Operations Table

| Fire Area/Zone | Recommended Actions to Manage Fire Risk |
|---|---|
| EDG1B | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| PA/PA-NE | Limit hot work and/or prohibit transient combustible storage along the outside of east walls of the Relay Room Annex and AVT building, between the AVT and outside storage tank, and in the area between the PPSA (Preferred Power Supply A) enclosure and brick wall in the transformer yard, and/or provide a continuous or periodic fire watch. |
| PA/PA-SW | Limit hot work and /or prohibit transient combustible storage along the southeast side of the Butler Building, and/or provide a continuous or periodic fire watch. |
| RC/RC-1 | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| RC/RC-2 | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| RC/RC-3 | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| RC/LOOPA | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| RC/LOOPB | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| RC/T-PRZR | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| RC/TREACTOR | Limit hot work and/or prohibit transient combustible storage in this fire zone, and/or provide a continuous fire watch. |
| SH/SH-1 | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| SH/SH-2 | Limit hot work and transient combustible storage in this fire zone. Verify detection and suppression systems are functional. Follow TRM TR 3.3.4 and TR 3.7.2 requirements for detection and suppression systems. |
| YARD | Limit hot work and/or verify that the available fire detection systems located in the fire zone are functional (post firewatch prior to entering HRE conditions if system(s) are impaired), and /or limit transient combustible storage in this fire zone, and verify existing controls on switchyard activities are adequate. |

# APPENDIX E SUMMARY OF ENGINEERING EVALUATIONS

The following is a summary of the engineering evaluations that have been prepared to document and justify general fire protection within the plant. For each evaluation the following is presented:

1. The evaluation number;
2. The evaluation title;
3. The date of the evaluation;
4. The applicable fire area and fire zones, and;
5. A brief summary of the purpose and conclusions of the evaluation.

In the event that the evaluation is not specific to a fire area/fire zone, or involves an evaluation of plant wide configurations (e.g., penetration seals), the word "general" has been used in the fire area/fire zone column.

# Table E-1
## Summary of Engineering Evaluations

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-CE-93-081, Rev. 1 | Turbine Building Pressure Walls Seals | 1/26/94 | TB-1<br>TB-2<br>TB-3 | Develop criteria to determine the thickness of Dow Corning 3-6548 Silicone RTV Foam required to withstand the peak pressures resulting from breaks in the 20" feedwater line or the 12" steam line in the TB at Ginna Station. |
| DA-CE-95-161, Rev. 2 | Diesel Fire Pump Control Panel Anchorage | 7/14/00 | SH/SH-2 | The purpose of this design analysis was to verify the adequacy of the anchorage of the Diesel Engine Fire Pump Controller Cabinet. |
| DA-ME-2000-040, Rev.3 | City Water Yard Loop X-Tie to Fire Yard Loop Hydraulic Calculation | 7/16/07 | All | Determines what systems the city water yard loop can provide a 100% backup for the fire yard loop. Also includes calc to prove 75psi can be achieved at the two highest nozzles. |
| DA-ME-2000-052, Rev. 0 | Fire Detection System Evaluation | 8/31/00 | All | Documents a review of the fire detector location and spacing relative to the fire hazards. |
| DA-ME-2000-062, Rev. 0 | Evaluation of the Impact of Fire on Service Water Piping in EDG1B | 9/14/00 | EDG1A<br>EDG1B | Documents acceptability of the Service Water piping that provides cooling water to diesel generator 'A' in fire area EDG1A. This is routed through fire area EDG1B. |
| DA-ME-2000-063, Rev. 0 | Evaluation of Post Fire Smoke Removal Capabilities | 10/27/03 | All | Provides an evaluation of the smoke removal capabilities. |
| DA-ME-2000-064, Rev. 2 | Evaluation of Fire Zone RR Relay Room | 2/23/06 | CC/RR | Address reconfiguration of Relay Room fire zone to include RRA and RR MUX. |
| ECP-09-000546 Rev. 0 | Change the required completion time to pull stop the TDAFW Pump | 3/22/2010 | CC/BOP | Provides and evaluation of the required time to pull stop the TDAFW Pump. |
| DA-ME-2000-079, Rev. 0 | Engineering Evaluation of the Lack of Full Area Suppression in Fire Area ABI | 9/26/00 | ABI/General | Provides bases for acceptability for the lack of full area supression in Fire Area ABI. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| ECP-12-000343<br>Rev 0 | Evaluate equivalent replacement of hydrant no. 8 with a Kennedy K-81d hydrant | 4/13/12 | General | Eqivalency. Kennedy model K-81D is an equivalent replacement for Dresser model 500 hydrants with the same fit, form and function. |
| DA-ME-92-024,<br>Rev. 0 | Pipe Stress Analysis for Fire Protection Pipe in the Turbine Building. Resolution of pipe minimum wall violations given in the MEIS Report No: M92139, dated 05/02/92. | 9/10/92 | BOP/TB-1<br>BOP/TB-2<br>BOP/TB-3<br>BOP/TB-1FP | The purpose of this design analysis is to substantiate that the fire protection line in the Turbine Building piping system that feeds the fire water storage tank that is experiencing general corrosion as reported by MEIS summary report M92139 is acceptable. |
| DA-ME-92-101,<br>Rev. 0<br>(ME Calc. No.: 91-0031) | Analysis of Penetrations Air Handling Room, Relay Room, Pressure Wall, Cable Tunnel Smoke Barriers and NCR 90-426 | 2/28/92 | CC/AHR<br>CC/RRCT<br>CC/BRRM<br>BOP/TB-1<br>BOP/TB-2<br>BOP/AVT<br>ABI/IBN-1<br>ABBM/ABM | The purpose of this analysis is to review fire barrier penetration seals with unique configurations in the Air Handling Room, Relay Room, and Cable Tunnel Smoke Barriers, to evaluate the heat shield characteristics of pressure walls and to disposition NCR 90-426 concerning duct penetration TBE-24-P. |
| DA-ME-92-105<br>(ME Calc. No. 91-0034)<br>Rev. 0 | Analysis of Fire Barriers Penetration Seals for the Control Room Fire Area and Combustible Loading Projections for Ginna Station | 1/21/93 | CC/CR<br>CC/RR | The purpose of this analysis is to generically analyze the following fire barrier concerns in the Control Room fire area identified based on the review of the Fire Barrier Penetration Seals Program Database:<br>1. Evaluate all Control Room fire barrier seals which were identified to require upgrade<br>2. Evaluate the heat shield effects of the Control Building Pressure wall<br>3. Review database issues such as unknown foam seal depth, 6" minimum foam seal depth installed, presence of Kaowool, no external seal etc.<br>4. Development of qualification basis for all seals in the Control Room fire area.<br>This analysis also includes an evaluation of combustible loading trends throughout the plant |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-92-106, Rev. 1 | Analysis of Steel Fire Protection and Fire Barriers | 9/6/95 | ABI/IBN-1<br>ABI/IBN-2<br>BOP/SB-1<br>BOP/SB-2<br>BOP/TB-1<br>BOP/TB-2<br>BOP/TB-1FP<br>BOP/TSC-1M<br>BOP/TSC-1S | Analysis of building steel fire protection configurations and fire barriers that were identified to be deficient or required review under NCRs 90-044, 045, 052, 083, 174 and 286. An analysis of the fire rating of 8" hollow concrete block walls and 6" thick concrete floor fire barriers was also performed.<br>Several unique fire barrier configurations were upgraded with Pyrocrete 241 materials as specified by ECN 4941-8 and the adequacy of the completed upgrades were documented within this Design Analysis. |
| DA-ME-92-125, Rev. 0 | Outlet Pressures and Flows in a 3 inch Fire Hose | 2/18/93 | General | The objective of this analysis was to calculate velocities, friction losses, flows, forces and pressures in the fire service water diesel generator "A" alternate water supply system. These flow conditions were evaluated when the 2 1/2" kennedy gate valve at the hose inlet is in the positions of full open, 1/4 closed, 1/2 open, and 3/4 closed. Also, the design analysis verified the "Crane Companion" program by ABZ & Crane Co. |
| DA-ME-92-140, Rev. 1 | Containment Hose Reel Hydraulic Calculation | 1/24/95 | RC/RC-1 through RC-3 | Determine the correct position of adjustable restrictors inside pressure reducing devices which were installed at hose reels in Containment through the calculation of pressure drop from the Screenhouse, the expected nozzle inlet pressure at each of the hose reel stations. |
| DA-ME-92-145, Rev. 0 | Controlled Intermediate Building Sub-Basement Fire Protection Systems Evaluation | 12/1/92 | ABI/IB-0 | To evaluate the existing fire protection features which are installed for the controlled intermediate building sub-basement area; to determine if any additional fire protection is necessary; and to review the basis of the RG&E commitment to the provisions of Appendix A to BTP APCSB 9.5-1, Section C.3.D, to install hose reel stations in all safety related areas as it may apply to the controlled intermediate building sub-basement area. |
| DA-ME-93-042, Rev. 0 | Analysis of Replacement Fire Dampers for Penetrations TBW-2-P and TBW-3-P | 4/10/93 | BOP/SB-2 BOP/TB-2 | Analysis of the proposed replacement of fire dampers for fire damper upgrade for dampers TBW-2-1, TBW-2-2, TBW-3-1 TBW-3-2, TBW-3-3, TBW-3-4, TBW-3-5, TBW-3-6 and TBW-3-7. The acceptability of the proposed fire barrier penetration seal upgrades for the proposed fire damper installations and respective damper expansion areas against NFPA code requirements are also analyzed. |
| DA-ME-93-108, Rev. 1 | Diesel Fire Pump Fuel Consumption Calculations | 4/1/04 | SH/SH-2 | Analysis documents the diesel fuel tank requirements for the diesel fire pump and the length of time the pump can operate at full load with the minimum stored supply of diesel fuel which is maintained in a local storage tank. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-93-117A, Rev. 0 | Generic Letter 86-10 Evaluation Containment Electrical Penetrations | 12/9/94 | ABBM/ABM<br>RC/RC-2<br>RC/RC-3<br>ABI/IBN-1<br>ABI/IBN-2<br>ABI/IBS-1<br>ABI/IBS-2 | Evaluate forty three (43) electrical penetrations into Containment to ensure fire propagation through a penetration will not adversely impact safe shutdown. |
| DA-ME-93-117B, Rev. 0 | Out of Wall and Special Fire Damper Configurations | 12/31/94 | See Summary | The purpose of this analysis is to analyze thirty-seven (37) fire dampers to ensure/justify that these installations are adequate for the fire rated barriers they penetrate and that the configurations are adequate to withstand the hazards in the fire area in which they are installed. Also included is justification for a back-to-back configuration using two (2) one and one-half (12) hour rated fire dampers to achieve a three (3) hour separation (fire dampers 1-350-1 and 1-350-2). The following fire dampers were analyzed:<br>CP-13 and CP-13A (CHG to ABBM/ABB)<br>I-350-1 and I-350-2 (ABI/IBN-2 to BOP/SB-2)<br>I-411-1 through I-411-21 (ABI/IBS-2 to ABI/ABO)<br>A-21, A-119 (ABI/ABO through ABBM/ABM)<br>CP-3, CP-4, CP-12, CP-31 (CHG to ABBM/ABM)<br>I-27 (ABI/IBS-1 to BOP/SB-1WT)<br>I-317, 1-318-1 through I-318-4 (ABI/IBS-3 to ABI/ABO)<br>I-340-1 and I-340-2 (ABI/IBS-2 to BOP/SB-2) |
| DA-ME-93-119, Rev. 0 | Analysis of Replacement Fire Dampers for AH-44, BA-33 and BB-46 | 8/13/93 | BOP/TB-1 to CC/AHR (AH-44)<br>CC/AHR to BR1A (BA-33)<br>BR1A to BR1B (BB-46)<br>BOP/SB-2 to ABI/IBS-2 (1-402-P) | The analysis was prepared to analyze the proposed replacement of fire dampers AH-44, BA-33, and BB-46 in order to determine if the proposed fire damper replacements design by Caledonian Associates is acceptable and also to document the acceptability of the replacement fire dampers in meeting the requirements set in RG&E Design Criteria, Fire Dampers, EWR 4882. Also, the acceptability of the upgrade of penetration seal I-402-P by abandoning the existing fire damper and mortaring close the existing wall opening between the Service Building and 1ntermediate Building Controlled side was evaluated. |
| DA-ME-94-004, Rev. 0 | Fire Protection Hose Reels | 1/12/94 | General | To evaluate the acceptability of the existing fire protection hose reels to adequately cover the areas the areas within the limits of their hose stretch lengths and with respect to their physical locations and to verify that the lengths of hose on each reel will meet NFPA and NRC criteria for controlling a fire within the plant. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-94-015, Rev. 0 | Turbine Building Smoke Removal Capability | 2/8/94 | BOP/TB-1 through TB-3 BOP/TB-1FP | Review the Turbine Building Ventilation System as relating to its ability to remove smoke as identified in NRC Information Notice 93-71, dated September 15, 1993 and address item F of the OPs Assessment, CATS item R03692 |
| DA-ME-94-017, Rev. 0 | Appendix R Fire Barriers | 2/3/94 | General | Provide the technical basis for plant fire barrier hourly ratings identified in "Appendix R Alternative Shutdown System for Ginna Nuclear Power Plant" Rev. 6 dated 8/93 and to complete a comprehensive review of the hourly ratings of all plant fire barriers. Verify that the fire barriers stated in the Appendix R report submittal coincide with the fire barrier ratings which are specified on the Fire Barrier Penetration Seal Program Drawings and address any differences found in this analysis. |
| DA-ME-94-025, Rev. 0 | Radwaste Storage Building Fire Suppression System Evaluation | 8/08/94 | N/A | Analysis to evaluate the combustible loading in the Radwaste Storage Building and determine whether the existing sprinkler system can deliver adequate fire protection water. This analysis will also evaluate the capacity of the Radwaste Storage bunker and determine the minimum bunker volume required to contain runoff of fire suppression water. |
| 51-9159545 Rev. 000 | R. E. Ginna Nuclear Station Code Compliance Evaluation for NFPA 30, Flammable and Combustible Liquids Code, 2000 Edition | 6/29/11 | General | The purpose of this evaluation is to assess the compliance level of the storage, handling, and use of flammable and combustible liquids at R. E. Ginna Nulclear Station (REG) with the requirements of NFPA 30, Flammable and Combustible Liquids Code, 2000 Edition. |
| 51-9159544 Rev. 000 | R. E. Ginna Nuclear Station Code Compliance Evaluation for NFPA 600, Standard on Industrial Fire Brigades, 2000 Edition. | 6/30/11 | General | The purpose of this evaluation is to assess the compliance level of the Industrial Fire Brigade Program at R. E. Ginna Nuclear Station (REG) with the requirements of NFPA 600, Standard on Industrial Fire Brigades, 2000 Edition. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-94-082, Rev. 1 | Fire Protection 86-10 Evaluations of Various Issues and IDR 96-0068 Resolution | 3/16/07 | See Summary | Integration of several design analyses into a single design analysis. The fire protection evaluations included the following seven (7) topics:<br>1. Cable Tunnel - Fire Boundary, dated 10/17/86: Assess the adequacy of fire barrier in Fire Area CT after the features installed under PCR 2004-0022 to meet the intent of Appendix R for safe shutdown.<br>2. Relay Room - Fire Area Boundary, dated 10/17/86: Assess the adequacy of the fire barrier in Fire Area CC/Fire Zone RR, which is penetrated by a bus duct at the north and south walls, to meet the intent of Appendix R for safe shutdown capability. (YARD, BOP/TB-2, CC/RR)<br>3. EDG1B - Fire Area Boundary, dated 10/10/86: Provide clarification for the reconfiguration of Fire Area EDG1B to include the vault (Formerly Fire Area EDGV) due to a non-rated manhole cover. This evaluation demonstrates that there are no significant changes that would adversely affect this reconfiguration with respect to the original exemption requested or Appendix R compliance. (EDG1B) There is no adverse impact to this boundary as a result of PCR 2002-018.<br>4. Flame Retardant Coating of Cables, dated 3/4/86: Provide flame-retardant coating to localized section of power cables in the cable vault beneath EDG1B and to trays within 6 feet of the smoke barriers at the three entrances to the cable tunnel to meet the commitment for IEEE-383 cable. (CT, EDG1B, ABBM/ABM, CC/AHR, ABI/IBN-1)<br>5. Battery Room 1A - Fire Area Boundary, dated 3/19/86: Assess the adequacy of the fire barrier in Fire Area BR1A, which is to be provided with 1 hr. equivalent structural steel protection, to meet the intent of Appendix R for safe shutdown capability. (BR1A, BR1B, CC/RR, CC/BRRM, CC/AHR) |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-94-082, Rev. 1 cont. | | | | 1. Evaluation of Fire Door Assemblies, dated 10/20/86: Analyze the effects of modifications on fire door assemblies which include add-ons, cutaways and oversized protective plates. (BOP/TB-1, BOP/TO, ABI/ABO, ABI/IBS-2, BOP/TB-2, CC/RR, CC/BRRM, BOP/SB-2, BOP/SB-1)<br>2. Battery Room 1A - Automatic Suppression, dated 3/19/86: Provide justification for the lack of automatic suppression within Fire Area BR1A due to a change in fire area configurations. (i.e. BR1A was removed from Fire Area CC) This evaluation demonstrates that there are no significant changes that would adversely affect this reconfiguration with respect to original exemptions requested or Appendix R compliance. (BR1A) |
| DA-ME-94-113, Rev. 0 | Hydraulic Sprinkler Calculation for the Charcoal Unit G Deluge Fire Protection System S02/14 | 1/16/95 | ABBM/ABM | The purpose of this design analysis is to hydraulically calculate the Charcoal Unit G Deluge fire protection system S02/14, to determine the minimum requirements at the motor driven fire pump PFP02 or diesel driven fire pump PFP01, for the most hydraulically demanding path and also to determine if the system is in compliance with the GAI Design Specification P-RO-3187 and also satisfies NFPA requirements. |
| A11014-C-001 Rev. 1<br>(ECP-16-000608) | Evaluation of Steam Generator Blowdown Depressurization Following Fire and Trip | 7/28/17 | CR or RR | The objective of this calculation is to determine the blowdown depressurization response of the S/G's following a fire in the MCB DC distribution panel or relay which results in the loss of both MFW pumps w/concurrent reactor trip. It was determined that the S/G pressure is below the target pressure (260psig) for TDAFW pump operability, for at worst 18 minutes before S/G pressure recovers. |
| DA-ME-94-118-00, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Nelson Electric Multi-Cable Transits (MCTs) (PENQ-00) | 1/12/95 | General | The purpose of PENQ-00 is to document the acceptability of the Nelson MCTs at Ginna Station. |
| DA-ME-94-118-01, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Permanent Mortar Seals (PENQ-01) | 1/13/95 | General | The purpose of PENQ-01 is to document the acceptability of the penetration seals at Ginna Station which use mortar/grout. This type of seal is used to seal non-dynamic penetrations of masonry barriers. |

| **Evaluation Number** | **Evaluation Title** | **Date** | **Fire Area/Fire Zone** | **Summary** |
|---|---|---|---|---|
| DA-ME-94-118-02, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Permanent Caulk Seals (PENQ-02) | 1/13/95 | General | The purpose of PENQ-02 is to document the acceptability of the penetration seals at Ginna Station which use fire rated caulk. This type of seal is used to seal pipe and electrical penetrations of masonry and gypsum board barriers. |
| DA-ME-94-118-04, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Cable Tunnel Intermediate Building Smoke Barrier (PENQ-04) | 1/12/95 | ABI/IBN-1<br>CT | The purpose of PENQ-04 is to document the acceptability of the Cable Tunnel/Intermediate Building Smoke Barrier and its penetration seals. This barrier is used to prevent/minimize the spread of smoke in the event of a fire. |
| DA-ME-94-118-05, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Cable Tunnel Auxiliary Building Smoke Barrier (PENQ-05) | 1/12/95 | ABBM/ABM<br>CT | The purpose of PENQ-05 is to document the acceptability of the Cable Tunnel/Auxiliary Building Smoke Barrier and its penetration seals. This barrier is used to prevent/minimize the spread of smoke in the event of a fire. |
| DA-ME-94-118-06, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Cable Tunnel Air<br>Handling Room Smoke Barrier (PENQ-06) | 1/12/95 | CC/AHR<br>CT | The purpose of PENQ-06 is to document the acceptability of the Cable Tunnel/Air Handling Room Smoke Barrier and its penetration seals. This barrier is used to prevent/minimize the spread of smoke in the event of a fire. |
| DA-ME-94-118-07, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Relay Room Floor Penetration RR-SB-462-P (PENQ-07) | 1/12/95 | CC/RR<br>CC/AHR | The purpose of PENQ-07 is to justify the acceptability of the Relay Room/Air Handling Room penetration seal since the area which is sealed with foam materials (93" x 95") is larger than any tested configuration. This unique detail was developed because of the large size and depth of the foam seal in the Relay Room floor compared to other silicone foam seals at Ginna Station. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-94-118-08, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Snubber Detail (PENQ-08) | 1/13/95 | ABI/IBN-2<br>BOP/TB-2 | The purpose of PENQ-08 is to document the construction of three snubber penetrations of the Turbine Building/Intermediate Building fire rated block wall. These penetrations do not conform to a tested configuration and are not truly penetration seals but form the protection for pipe support snubbers which pass through this fire barrier to attach to structural steel. This evaluation demonstrates that it is unlikely that the snubber penetrations will be seriously exposed in the event of a fire and that the configuration used to protect them will prevent the propagation of fire from one side of the barrier to the other. PENQ-08 identifies penetrations as I-379, I-380, and I-381 located on elevation 278'-4" of the Intermediate Building. |
| DA-ME-94-118-09, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Seismic Gap (PENQ-09) | 1/13/95 | ABBM/ABM<br>ABI/ABO<br>ABI/IBS-1<br>ABI/IBS-2<br>ABI/IBS-3 | The purpose of PENQ-09 is to document the acceptability of the seismic gap penetration seals at Ginna Station which use silicone foam. This type of material is also used to seal pipe, conduit and tubing penetrations in the seismic gaps. |
| DA-ME-94-118-10, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Cable Tray Penetrations (PENQ-10) | 1/13/95 | General | The purpose of PENQ-10 is to document the acceptability of the cable tray penetration seals at Ginna Station which use silicone foam. This type of seal may also contain pipe or conduit penetrants. |
| DA-ME-94-118-11, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Pipe/Conduit/Sleeve Penetrations (PENQ-11) | 1/13/95 | General | The purpose of PENQ-11 is to document the acceptability of the pipe, conduit, sleeve or other similar penetration seals at Ginna Station which use silicone foam. The same seal design is used for both two and three hour rated barriers. |
| DA-ME-94-118-12, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Boot Seal Assembly (PENQ-12) | 1/16/95 | General | The purpose of PENQ-12 is to document the acceptability of the boot seals used on penetrants at Ginna Station which have significant movement (generally due to thermal expansion of the pipe) and/or high working temperature pipes where foam seals cannot be installed. |
| DA-ME-94-118-13, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Non-Regulatory Fire Barrier Seals (PENQ-13) | 1/16/95 | General | The purpose of PENQ-13 is to document the acceptability of the penetration seals provided in non-regulatory barriers such as property conservation fire rated barriers, Halon seals and water seals. These barriers are used to prevent and/or minimize the spread of water in the event of a fire but are not part of the regulatory fire protection program at Ginna Station. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-94-118-14, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Temporary Penetration Seals (PENQ-14) | 1/16/95 | General | The purpose of PENQ-14 is to document the acceptability of ceramic fiber as a temporary penetration seal for sealing a hole in an existing foam seal or as a temporary replacement for mortar/grout caulk seals. The intent is for these seals to remain in place while a modification/maintenance package is being completed and they are replaced with a permanent seal after all work on new or reworked penetrants has been completed. The temporary penetration seal can also be used to replace a missing/degraded seal while engineering and work planning for a replacement seal is completed. |
| DA-ME-94-118-15, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Open/ Dynamic Penetrations (PENQ-15) | 1/16/95 | General | The purpose of PENQ-15 is to document the justification for not fully sealing several penetrations in Appendix R and or UFSAR fire barriers due to the requirement that the penetrant be able to move to allow operation of a valve stem. Reach rods and or allow the movement for fire door operator cable/chain. These penetrations do not conform to a tested configuration and are not truly penetration seals but, for the reasons listed in this evaluation, RG&E has determined they will prevent the propagation of fire from one side of the barrier to the other due to the small annular opening size. |
| DA-ME-94-118-16, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Two-Hour Cable Tray Penetrations (PENQ-16) | 1/16/95 | General | The purpose of PENQ-16 is to document the acceptability of the two hour cable tray penetration seals at Ginna Station which use silicone foam. This type of seal may also contain pipe or conduit penetrants. |
| DA-ME-94-118-17, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Internal Conduit Seals (PENQ-17) | 1/17/95 | General | The purpose of PENQ-17 is to document the basis and requirements for internal conduit seals at Ginna Station. This type of seal is used to seal the inside of conduits which extend more than 3' from the barrier surface. Conduits which terminate 3' or less from the barrier surface are considered as sleeves and the interior is sealed per one of the other fire barrier penetration seal program PENQ details. |
| DA-ME-94-118-18, Rev. 0 | Fire Barrier Penetration Seal Qualification Analysis for Construction Joints (PENQ-18) | 1/17/95 | General | The purpose of PENQ-18 is to document the acceptability of the construction of construction joints at Ginna Station for some block and poured wall configurations. This type of seal is used to allow required barrier movement due to expansion and contraction. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-94-118-99, Rev. 0 | Penetration Seal Design Basis | 1/17/95 | General | The purpose of PENQ-99 is to document the following items which were used in the preparation/revision of one or more of the individual penetration seal detail qualification analyses (PENQ-00 to PENQ-18):<br>1. The design bases for the penetration seal program at Ginna Station, including:<br>a. the rating of fire barriers and penetration seals,<br>b. the RG&E commitment for the fire test standard to be used in determining the rating of fire barriers and penetration seals<br>c. relevant sections of the comparison of the Ginna Station fire barrier/penetration seal program to the recommendations in BTP 9.5-1.<br>d. any exemptions granted as part of the NRC's review of the 10CFR50 Appendix R compliance strategy used at Ginna Station<br>e. specific responses/program revisions made in response to regulatory guidance on penetration seals such as NRC Information Notice 88-04<br>2. The structure to be followed in the individual analyses of each penetration seal detail and the fire test results used to support those details<br>3. A discussion of each of the critical parameters used in the individual analyses, the preferred method for obtaining information to support the value assigned to the parameter, the types of departures allowed from these preferred methods and the type of justification which must be provided to support "cherry picking" of partial results from several fire tests.<br>4. A discussion of the general notes for the penetration seal design detail drawings.<br>5. A justification for the classification of penetration seal deficiencies as the impact on their expected performance and the programmatic requirements for repair of deficient/degraded penetration seals. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-95-057, Rev. 0 | Hydraulic Sprinkler Calculation for the Service Building System S19 | 1/9/95 | General | Hydraulic demand calculation for the Service Building Sprinkler System S19. |
| DA-ME-95-058 | Contaminated Storage Building and Hot Shop Sprinkler Systems Actuation Evaluation | 1/18/95 | WS<br>SB-1HS | This analysis will evaluate whether the capacity of the Contaminated Storage Building sump is adequate to contain the potential runoff of fire suppression system in the event of the actuation of the building sprinkler system. This analysis also evaluates whether the floor area capacity of the Hot Shop is adequate to contain the runoff of fire suppression water in the event of the actuation of the fire water. |
| DA-ME-95-137, Rev. 0 | Fire Pump Relief Valves 5134 & 5135 Setpoint Change | 8/23/95 | SH/SH-2 | Analysis determines the appropriate relief valve setpoint for fire protection system pump relief valves 5134 and 5135. PCR 2001-0038 revised the setpoints to 165 psig. |
| DA-ME-95-148, Rev. 0 | Orifice LWD03 Removal Evaluation, Auxiliary Building Basement Sump Drain | 9/20/95 | ABBM/ABB | The purpose of this design analysis is to determine whether the basis for the installation of drain orifice LWD03 in the Auxiliary Building basement floor drain header to the sump still exists or whether LWD03 may be removed. LWD03 was installed in the floor drain header to restrict the addition of fire suppression system water to the sump so as not to overflow the sump and flood the residual heat removal (RHR) sump pit. |
| DA-ME-95-149, Rev. 0 | Evaluation of Fuel Oil Supply Piping for Diesel Fire Pump KFP01 | 12/20/95 | SH/SH-2 | The purpose of this design analysis is to evaluate the use of copper tubing and fittings (as specified in Line Spec 125-1) for the fuel supply system associated with the Diesel Fire Pump, KFP01. This analysis provides justification for using materials other than those specified by the service requirements of ME-318, Line Spec 150-6 (Fuel Oil). |
| DA-ME-95-154, Rev. 1 | Auxiliary Building Operating Floor RWST Barrier Gap Penetration Seal A-803-P Evaluation | 11/30/95 | ABBM/ABM<br>ABI/ABO<br>ABBM/ABB | Evaluate the in place compensatory measures implemented upon discovery of the current configuration of the Auxiliary Building operating floor barrier gap (without an eight foot high concrete block "shield wall"), at the RWST interface. Evaluate the proposed installation of a temporary seal at the RWST gap interface to allow the removal of hourly fire watch compensatory measures. Evaluate the proposed permanent configuration of this gap area after RWST tank stiffeners and retention plates are installed under PCR 95-063 which provides a floor barrier configuration which is commensurate with the hazards. |

| **Evaluation Number** | **Evaluation Title** | **Date** | **Fire Area/Fire Zone** | **Summary** |
|---|---|---|---|---|
| DA-ME-96-001, Rev. 0 | Hydraulic Sprinkler Calculation for the Steam Generator Building | 1/21/98 | General | Hydraulic demand calculation for the Steam Generator Building Sprinkler System |
| DA-ME-96-070, Rev. 1 | Hydraulic Sprinkler Calculations for Fire Protection Systems | 11/26/01 | General | The purpose of this design analysis is to determine the hydraulic demand at the base of the sprinkler system riser and to determine if the motor or the diesel fire pumps can supply the calculated pressure and flow to the following systems:<br>1. Turbine Island (S26)<br>2. Oil Storage Room (S16)<br>3. Seal Oil Unit (S25)<br>4. Turbine Oil Reservoir (S27)<br>5. Condenser Pit Deluge (S24)<br>6. Transformer #11 (S21)<br>7. Transformer #12A (S22)<br>8. Transformer #12B (S23)<br><br>Revision 1 included the revised system demand for suppression system S26 which was upgraded under PCR 2001-0026. |
| DA-ME-96-108, Rev. 0 | Hydraulic Sprinkler Calculation for the GSU Transformer System | 11/9/96 | General | Hydraulic demand calculation for the Main Transformer Suppression System S20, which was modified with the GSU replacement. |
| DA-ME-97-081, Rev. 1 | Engineering Evaluation of Fire Protection System Inspection and Testing Performance | 2/10/00 | General | The purpose of this engineering evaluation was to document the review of the fire protection surveillance procedures that was performed to extend the frequencies of the surveillances based on past performance data and other pertinent factors. |
| DA-ME-98-004 | Combustible Loading Analysis | Update Yearly | All | Identify the assumptions, methodology and results of the combustible loading analysis update and database. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-98-083 Rev. 0 | Engineering Evaluation of the Reconfiguration of Appendix R Fire Areas AVT, H2, SB, TB and TO into Appendix R Fire Area BOP | 6/4/99 | BOP | Evaluation provides basis for reconfiguration of various fire areas into Fire Area BOP. |
| DA-NS-92-118-00, Rev. 0 | Engineering Work Request 10022 (Short Form) | 11/23/92 | General | Identification of the Basis for: The assumption of no off-site power for fire scenarios; Lack of high impedance fault analysis; Lack of an overall Design Basis Document for Fire Protection; Lack of a basis for illumination levels of emergency lighting; and review of common mode failures of electrical cables due to lack of separation. |
| ESM-97-009, Rev. 0 | Effectiveness Review of RCP Motor Lube Oil Spillage Collection | 2/9/98 | RC/RC-1<br>RC/RC-2 | Review adequacy of installed RCP Oil Collection system. |
| EWR 3986, Rev. 2 | Effects of Heat Transfer to Fire Wrapped Conduit Through Conduit Supports During Potential Fires | 10/11/88 | ABBM/ABB<br>RC/RC-2<br>ABI/IBN-1<br>BR1B<br>ABBM/ABM<br>CT | Analysis is to provide a basis for evaluating the impact of heat transfer from a fire source, through conduit supports to fire wrapped connecting hardware and conduit, to the cable. The conduit is wrapped using the 1-hr HEMYC cable wrap system. The following circuits were evaluated: E20, E22, E53, L400, C687, L398, R975, R1468, R1462, R1475, R1467, R877A, and R1133. |
| EWR 4882 | Fire Protection Evaluation for justification of the absence of a fire damper in duct penetration RR-113-P (RG011843) | 07/01/91 | CC/RR | The purpose of this evaluation was to provide justification for the absence of a fire damper in duct penetration RR-113-P. Modifications later completed under PCR 96-125 removed the MUX room from the Control Room HVAC system and this wall opening was mortared closed to restore the fire barrier wall. |
| EWR 3986, Rev. 0 | Ampacity of Appendix R Circuits Covered with HEMYC Fire Wrap | 6/24/86 | ABBM/ABB<br>BR1B<br>ABBM/ABM | Analysis is to ensure that the ampacity of circuits covered with HEMYC fire wrap will not be reduced below the operating current for circuits C687, E20, E22, E53, L318, L398 (cable tray 111). |
| EWR 1850, Rev. 0 | Conduit Fire and Smoke Seals | 9/23/88 | General | Review licensing requirements, and provide a technical basis for internal conduit seals. Provide a technical basis for the internal conduit seal requirements in RG&E Specifications EE-15 and EE-24. Determine if the technical basis for internal conduit seal requirements in RG&E Specifications EE-15 and EE-24 meet or exceed the licensing requirements. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| EWREEA-17001, Rev. 0 | Comparison of Radiant Energy Shield with Fire Wrap Performance for Conduit Fire Protection | 6/12/91 | RC/RC-2 | Provide a quantitative basis for comparing the relative effectiveness of the HEMYC fire wrap system with that of "non-combustible radiant energy shields" such as Marinite board. This fire wrap is used to enhance the physical separation of redundant circuits (in conduit) with less than 20 feet of horizontal separation. The circuits protected in this way are R1467, R877A and R1133. |
| EWR 3986-6, Rev. 0 | Appendix R Fire Wraps | 12/15/89 | ABBM/ABB<br>RC/RC-2<br>ABI/IBN-1<br>BR1B<br>ABBM/ABM | Provide a comparative evaluation of acceptance criteria for the HEMYC 1 hour rated fire wrap. |
| M-97-001, Rev. 0 | RCP Motor Lube Oil Collection System Oil Inventory and Flow Calculations | 2/9/98 | RC/RC-1<br><br>RC/RC-2 | Review adequacy of installed RCP Oil Collection system. |
| ME-91-0015, Rev. 0 | Fire Water Spray for TDAFW pump | 02/22/91 | ABI/IBN-1 | The purpose of this evaluation was to determine if the relocation of two (2) existing spray nozzles are required to provide sufficient fire suppression capabilities for the Turbine Driven Auxiliary Feedwater pump (TDAFWP). |
| ME-91-0020, Rev. 0 | Analysis of Penetrations AH-45-P and AH-9A-P | 5/20/91 | BOP/TB-1<br>CC/AHR | The purpose of this calculation is to determine the necessary disposition of NCR 96-446, which was written on fire seals AH-9A-P and AH-45-P since these seals do not meet the fire rating of the barrier. |
| DA-ME-2001-031 Rev. 3 | Evaluation of Suppression System Flow and Pressure | 12/20/12 | ALL | Provides summary of suppression system demands on plant fire pumps and the yard loop. |
| DA-ME-2002-040 Rev. 2 | Hydraulic Sprinkler Calculations for the D/G Rooms A and B Fire Systems | 10/24/03 | EDG1A<br>EDG1B | Provides hydraulic calculation of both protection systems and upgrades completed under PCR 2001-0021. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| ME-91-0022, Rev. 1 | Analysis of Penetrations in A & B Battery Rooms NCR 91-410 | 7/31/91 | BR1A<br>BR1B<br>CC/AHR<br>CC/RR<br>BOP/TB-1 | This analysis was written to disposition NCR 91-410, which was written on numerous ceiling fire barrier penetration seals in the B Battery Room. A number of other A and B Battery Room fire barriers are also discussed to provide guidance during maintenance activities. The following Penetration seals were evaluated:<br>BRIB<br>RR-CVCS-1-P, RR-CVCS-2-P, RR-RCS-2-P, RR-RCS-1-P, RR-RR-1-P, RR-RW-1-P, RR-RB-1-P, RR-RY-I-P, RR-M-1-P, RR-RR-2-P, RR-RW-2-P, RR-RB-2-P, RR-RY-2-P, RR-RTLR-2-P, RR-RA-1-P, R-MRPI-3-P, RR-MRPI-2-P, RR-MRPI-1-P, RR-24-P, RR-RLTR-1-P, RR-36-P, RR-36A-P, RR-36B-P, BA-5A-P, BB-65-P, BB-42-P, BB-63-P<br>BR1A<br>RR-SA-P, RR-M-2-P, RR-RA-2-P, RR-RA-3-P, RR-FW-P, RR-SI-A1-P, RR-SI-A2-P, RR-SI-B1-P, RR-SI-B2-P, RR-27-P, BA-11-P, BA-7A-P, BA-7-P |
| ME-92-0006, Rev. 0 | Analysis of Penetrations and Fire Barriers: Standby Auxiliary Feedwater and Auxiliary Building Interface | 2/28/92 | SAF<br>ABI/ABO | The purpose of this analysis is to:<br>I. Evaluate the necessity of sealing several Auxiliary Building South wall penetrations that interface with the Standby Auxiliary Feedwater (SAF) Building in the area between column lines $9_a$-$11_a$/Q<br>2. Analyze and stipulate the design basis of the fire rating of the south wall of the Auxiliary Building adjacent to the SAF Building corridor (a temporary structure) between column lines $TS_1$-$TS_3$/Q<br>3. Evaluate the existing configurations of several fire barrier penetration seals in the SAF Building North was to determine if the existing configurations are acceptable<br>The following seals were included in the analysis:<br>A-114B-P, A-114C-P, A-594-P through A-614-P, SA-1-P through SA-8-P, SA-10-P, SA-11-P and SA-6A-P through SA-6L-P. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| GC1569 | Fire Protection Study for Controlling Structural Failures Jeopardizing Cold Shutdown of Ginna Station | 5/27/80 (Rev 0)<br>9/16/80 (Rev 2) | General | Study to determine what active and passive fire protection systems should be installed to control structural failures that could jeopardize safe shutdown of the R. E. Ginna nuclear power plant. |
| EWR-1833-CALC-1 | Water Curtain Deluge System, Heat Transfer Analysis and Temperature Detector Response to a Turbine Building Fire | 3/12/81 | CC/CR<br>BOP/TB-3 | Evaluation of the effectiveness of the control room wall fire protection system in limiting heat flow into the control room from an oil fire within the turbine building. |
| GC5190 | Heat Transfer Analysis During a Turbine Building Fire | 7/25/78 | CC/CR<br>BOP/TB-3 | Evaluation of the effectiveness of the control room wall fire protection system in limiting heat flow into the control room from an oil fire within the turbine building. |
| EWR-1833-CALC-2 | Temperature Detector Response to a Turbine Building Fire | 9/9/80 | CC/CR<br>BOP/TB-3 | Determine the temperature detector response to a fire in the turbine building which is also heating up the control room pressure wall. |
| NSL-0000-DA025, Rev. 0 | Justification for Removal of Fire Watch Patrol for Duct Penetration #RR-113. | 1/9/91 | CC/RR | Demonstrate that the existing conditions of duct Penetration RR-113 (installed without a fire damper) does not violate Appendix R compliance nor does it require the action statement 3.14.6.1 of Tech. Specs.<br>Note: PCR 96-125 removed the duct and the barrier was sealed closed with masonry material. |
| TSR 93-089, Rev. 0 | Containment Wood Spacer | 3/14/94 | RC/RC-2 | Technical evaluation to prove the wood cable support in Containment does not create a fire hazard and does not increase the fire loading of fire zone RC-2 beyond its designed fire load. |
| TSR 94-051, Rev. 0 | Appendix R Conformance Review of Reactor Stud Stands and Telephone Cables in Containment | 4/11/94 | RC/RC-1 through RC-3 | Determine if the reactor stud storage stands and telephone cables in containment are in compliance with Ginna fire protection requirements |
| DA-ME-99-073 Rev. 0 | Fire Brigade Breathing Air Capabilities | 10/5/99 | General | Documents capability to meet NRC Appendix A commitments for site breathing air capability. |
| DA-ME-2002-005 Rev. 0 | Primary and Secondary Hydrogen Storage Buildings NFPA 50A Code Review | 2/25/02 | General | Documents NFPA 50A code review of primary and secondary hydrogen storage buildings. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| Altran Calculation Number 91171-C-01 | Fluid Hydraulic Analysis of the Fire Protection Yard Loop Piping with the Backflow Preventer | 9/91 | EDG1A<br>EDG1B<br>SAF<br>YARD | Documents capability of yard fire water loop to provide alternate cooling for either diesel generator and SAFW pump make up water. |
| DA-EE-2000-066 Rev. 2 | Appendix R Conformance Analysis | 8/6/08 | General | Demonstrates the station's ability to safely shutdown during a fire in any plant fire area. The analysis included the identification of systems or system components that are free from the effects of a fire in any given fire area and can be used to achieve and maintain hot shutdown. Appendix R electrical safe shutdown equipment and cables potentially affected by a fire were identified and evaluated for each plant fire area. Equipment loss assumptions and equipment availability assumptions presented in the Appendix R Safe Shutdown Analysis were validated. |
| DA-ME-2000-096 Rev. 1 | SBAFWP Room Cooling Using Smoke Ejector Fans | 3/13/07 | SAF | Documents ability to utilize smoke ejector fans to provide required ventilation for operability of SAF pumps in the event normal power supplies are not available. |
| DA-EE-99-068, Rev. 3 | Vital Battery Room Hydrogen Analysis | 7/13/11 | BR1A<br>BR1B | Evaluates hydrogen generation for the vital batteries and determines that hydrogen concentrations will remain below the 2% level up to 66 hours without ventilation. |
| DA-EE-97-069 Rev. 5 | Sizing of Vital Batteries A and B | 3/14/11 | BR1A<br>BR1B | Establishes required size of vital batteries. |
| DA-ME-2000-075 Rev. 3 | Pressurizer, Volume Control Tank and RWST Evaluations for Appendix R | 3/28/06 | General | Evaluates drain down time of pressurizer with no charging, drain down time of RWST if MOVs 850A or B open, determines time for VCT to drain if letdown is isolated and minimum RWST inventory. |
| DA-ME-95-073 Rev. 1 | Standby Auxiliary Feedwater Pump Room Cooling Unit Heat Removal | 3/13/07 | SAF | Determines the minimum amount of heat that a standby auxiliary feedwater pump room cooling unit (AFP01 or AFP02) needs to remove to keep the SAFW Pump Building below 120°F for 72 hours following a single SAFW pump start and an outside air temperature of 91°F. |
| DA-ME-97-045 Rev. 1 | Service Water Hydraulic Model | 10/18/10 | N/A | Determines minimum required diesel cooling flow for safe shutdown loads. |
| CN-SEE-04-86 109682-M-025 | Condensate Inventory Requirements for Station Blackout Event | 6/9/05<br>6/28/05 | N/A | Determines minimum required CST volume and duration to deplete inventory. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-98-138 Rev. 2 | Emergency Diesel Generator Lube Oil and Jacket Water Heat Exchanger Plugging Limits and Thermal Performance at Limiting Service Water Flows | 9/26/11 | N/A | Determines new outside diameter heat transfer coefficients for Emergency Diesel Generator Lube Oil and Jacket Water Heat Exchangers. |
| DA-ME-2000-001 Rev. 5 | City Yard Loop Capability to Supply Cooling Water to EDG, SAFW, and Screenhouse Fire Systems with the Loss of Service Water | 12/20/11 | SH/SH-1, SH-2, SH-3, SAF, EDG1A, EDG1B | Purpose of the analysis was to determine the capability of the city water yard loop to provide an alternate supply of cooling water to the SAFW pumps and the EDGs. |
| LR-FP-PROGPLAN, Rev. 5 | License Renewal Aging Management Program Basis Document | 8/22/11 | General | Identifies activities of the Fire Protection Program that are credited for license renewal. The document provides a description of the program as it relates to the management of aging effects identified in the aging management review process and demonstrates that the program adequately manages the effects of aging for those systems, structures, and components (SSCs) for which it is credited. The document also demonstrates that the Fire Protection Program is consistent with, but includes exceptions to, NUREG-1801 (Generic Aging Lessons Learned (GALL) Report), Section XI.M26, "Fire Protection" (Ref 9.1). |
| LR-FWS-PROG-PLAN, Rev. 6 | License Renewal Aging Management Program Basis Document | 8/25/11 | General | Identifies activities of the Fire Water System Program that are credited for license renewal. The document provides a description of the program as it relates to the management of aging effects identified in the aging management review process and demonstrates that the program adequately manages the effects of aging for those systems, structures, and components (SSCs) for which it is credited. The document also demonstrates that the Fire Water System Program is consistent with, but includes exceptions to, NUREG-1801 (Generic Aging Lessons Learned (GALL) Report), Section XI.M27, "Fire Water System" (Ref 9.1). |
| DA-ME-99-064, Rev. 2 | Suppression System S38 Hydraulic Calc | 11/8/04 | BOP/TB-2 | Provides hydraulic calculation for S38 |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| DA-ME-2000-081 Rev. 0 | Suppression System S30 & S31 Hydraulic Calc | 12/20/00 | BOP/TSC | Provides hydraulic calculation for S30 & S31 |
| DA-EE-97-035 Rev. 3 | Station Battery Charger Minimum Required Output | 4/13/06 | General | Proves that the vital battery chargers will meet UFSAR and Technical Specification charging requirements |
| DA-EE-2001-028 Rev. 1 | Vital Battery 8 Hour Capacity | 3/12/05 | General | Documents adequate capacity of the vital batteries for an 8 hour station blackout (SBO) event |
| NESE1101 Rev. 2 | AAF International Analysis | 8/30/04 | | Fire Suppression System hydarulic calculations for Control Room Emergency Air Treatment System |
| ECP-10-000834 Rev. 0 | Perform a comparison between UL and ULC Standard for Fire Hose and Hose Assemblies | 2/10/11 | General | Equivalency. ULC is comparable to UL in regards to fire hose. |
| 51-9065290-000 Rev. 1B | NFPA 805 Radiological Release Transition Review | 12/7/12 | General | This is an assessment of the compliance of the Fire Protection Program in regards to the radioactive release requirements of NFPA 805. |
| ECP-11-000067 Rev. 0 | Equivalent Change Technical Evaluation of the flame spread and smoke generation values within ECP-2008-0058 Rev. 0 | 7/21/11 | General | Changes to the flame spread rate and smoke generation index do not affect coatings approved for use in ECP-2008-0058. Carboline 90/890N equivalent concrete floor coating has a flame spread rating of 5 (much lower then the required value of 25), and a smoke generation index of 20 (much lower than the required value of 450), by test method ASTM E84. |
| DA-ME-94-118-19 Rev. 0 | Special Boot Seals Evaluation | 8/3/95 | General | This evaluation determined the adequacy of boot seal installations throughout the plant. |
| DA-ME-2003-018 Rev. 1 | Replacement of Appendix R Fire Barrier in the "B" Diesel Generator Vault | 1/23/06 | EDG1B | The evaluation provided justification for replacement of the existing 3M CS-195 fire barrier and foam filled metal material barrier wall with an 8" thick clay brick fire barrier wall, using permanent motar/grout seals and foam seals for the penetration seals. |
| DA-ME-08-013 Rev. 0 | Evaluation of Screen House Roof Assembly | 3/13/08 | SH | The evaluation provides a justification that the combustible Screen House roof assembly and unprotected steel structure is adequate to house safety realted equipment based on the fire portection defense-in-depth features to mitigate the consequences of a fire within this building. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| 02-0950-1343 Rev. 0 | R. E. Ginna Station NFPA Code Compliance Assessment | 7/1/86 | General | This evaluation documented compliance with the requirements of NFPA 12A, 13, 14, 15, 20, 24, 26, 27, 30, 37, 72D, and 72E. |
| ECP-10-000301 Rev. 01 | Evaluate the Heatup of the Intermediate Bldg | 5/7/10 | IBN-1 / IBN-2 | This ECP evaluated the heat up of the Intermediate Bldg (IB) under a station blackout scenario to predict the building room temperatures to support potential operator actions during the coping period. |
| ECP-13-000508 Rev. 0 | Re-install 1" orifice in Aux Building Sub-basement drain line to sump | 5/30/13 | ABBM/ABB | This ECP evaluates putting orifice LWD03 back in the drain line to the Sub-bsmt sump to protect the RHR pumps in the event of an Aux Building Fixed Fire Suppression System actuation. |
| ECP-12-000919 Rev. 0 (Associated with 51-9183281-00A) | Engineering Evaluation to accept signed off Design Analysis 51-9183281-00A | 11/16/12 | General | This evaluation included the review of automatic or manual activation of plant fixed fire suppression systems |
| ECP-12-000198 Rev. 0 | Replace Z-16 Containment Fire Detection Zone Smoke Detectors | 11/16/12 | RC/RC-3 | The purpose of this ECP is to evaluate an equivalent replacement for the existing photoelectric smoke detectors located in containment fire detection zone Z-16. |
| ECP-12-000938 Rev. 0 (Associated with 51-9064339-003, Rev. 003A) | Engineering Evaluation to accept signed off document 51-9064339-003, Rev. 003A) | 11/19/12 | General | This ECP reviewed the changes to EIR 51-9064339-003 which is an assessment of the compliance of NFPA 805 Fundamental Fire Protection and Design Elements Transition review. |
| ECP-12-000799 Rev. 0 | Evaluation of Charging Pump availability during fire scenarios | 9/26/12 | ABBM | This evaluation demonstrates the availability of the "A" CCP by determining the amount of gas that will be entrained into the suction flow and the duration of the entrainment for an Appendix R Scenario. |
| ECP-11-000643 Rev. 0000 | Engineering Evaluation for Hazard Analysis for Large Transformer Relaibility per SOER 10-1, Recommendation 8. | 9/14/11 | YARD | This Engineering Evaluation formally documents the Large Power Transformer Hazard Analysis at Ginna Station per INPO SOER 10-1, Recommendation 8. The recommendation is intended to prompt a review of the potential hazards that could result from the failure of each of the large power transformers and to identify whether additional protective measures are necessary to enhance personnel or equipment protection. |
| EWR 1832B Rev. 07 | Fire Signaling System | 9/27/88 | All | Modification of existing fire detection and suppression systems for supervision and control |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| EWR 2463<br>Rev. 01 | Fire Dampers | 11/5/80 | ABI<br>ABBM<br>CC | The modification involves the installation of fire dampers in air conditioning and ventilation duct penetrations at (7) fire barrier locations |
| PCR 99-090<br>Rev. 01 | Enhancement to the Traveling Screen Spray Wash System Phase 1B | 6/19/01 | SH/SH-2 | The purpose of this Plant Change Request is to: Install a high pressure spray wash system off the fire water suppression system |
| PCR 2001-0038<br>Rev. 0 | Fire Pump Bowl and Shaft Assembly Upgrade | 10/04/02 | SH/SH-1 | The purpose of this modification is to upgrade both fire pumps |
| EWR 1834A<br>Rev. 0 | Design Analysis - Mechanical Fire Protection Package 3 | 08/03/79 | SH/SH-2 | The purpose of this design analysis is to determine if the curbed area around the diesel driven fire pumps and storage tank is adequate for tank volume plus 10% additional capacity |
| 02-0950-1343<br>Rev. 0 | R. E. Ginna Station NFPA Code Compliance Assessment | 07/01/86 | General | This evaluation documented compliance with the requirements of NFPA 12A, 13, 14, 15, 20, 24, 26, 27, 30, 37, 72D, and 72E. |
| PCR-2000-0048<br>Rev. 01 | Smoke Detection Upgrades | 11/10/04 | BOP/TB-1<br>BOP/TB-2 | The purpose of this Plant Change Request is to add two new smoke detection zones in the Turbine Building |
| DA-ME-13-001<br>Rev. 0 | Evaluation of Ginna Nuclear Station Appendix R Exemptions for transition to NFPA 805 | 2/18/13 | ABBM<br>ABI<br>BR1A<br>BR1B<br>CC<br>CT<br>EDG1B<br>SH | The purpose of this design analysis is to evaluate the existing R. E. Ginna Nuclear Power Station 10CFR50, Appendix R approved exemptions as "Adequate for Hazard" as defined within 10CFR50.48(c), NFPA 805. |
| ECP-13-000751 | Equivalent Replacement of Check Valve 2028 & 2010 | 8/21/13 | ABI<br>RC | The ECP evaluates an equivalent replacement valve for location 2010 and 2028 as the original check valve is obsolete. Hayward True Union PVC check valve is an equivalent replacement for Hayward plastic check valves manufacturer to bulletin CV-403, with the same fit, form, and function. |

| Evaluation Number | Evaluation Title | Date | Fire Area/Fire Zone | Summary |
|---|---|---|---|---|
| ECP-14-000704 Rev. 0 | Penetration A-918-P | 8/23/14 | ABBM<br>ABB | The purpose of this ECP was to provide direction for installation of a credited seal for the RHR suction piping which is capable of withstanding internal flooding due to fire system actuation. |
| ECP-14-000709 Rev. 0 | Evaluate AB Penetrations between basement and sub-basement levels for Internal Flooding Event | 8/24/14 | ABBM<br>ABB | ECP evaluates the configuration of existing seals on 21488-0122, 1 for capability of withstanding internal flooding. All seals found to be acceptable as-is. |
| ECP-13-00931 Rev. 0 | Installation of TSC fire detection zones | 12/9/14 | TSC | Installation and replacement of Z27, Z28, Z29, Z30, Z31, and Z39. Includes justification for using NFPA 72, 2015 edition. |
| DA-ME-13-018, Rev. 1 | S52 Hydraulic Calculation – SAFW Annex Suppression System | 12/20/13 | SAFW | Hydraulic calculation for fire suppression system S52. |
| ECP-15-000350 | NFPA13 – 1985 Chapter 3 Section 3-11.3.4.2 code deviation evaluation | 7/2/15 | ABI/IBN-1<br>ABBM/ABB<br>ABBM/ABM | The evaluation determined that the existing deviation is acceptable since there is a comp measure in place to drain these systems using the procedural direction in SC-3.12. |
| ECP-15-000410, Rev. 0 | Equivalency to restore fire wall 973-17-A | 7/27/15 | ABI/ABO<br>ABI/IBS-3 | This ECP details the new fire barrier to restore the fire resistance associated with Fire Wall 973-17-A using ASTM gypsum board. |
| DA-ME-15-007, Rev. 0 | Evaluation of 3 hr block wall between fire zones ABO and IBS-3 | 7/27/15 | ABI/ABO<br>ABI/IBS-3 | This design analysis determined that the new fire barrier installed per ECP-15-000410 creates a sufficient fire barrier for the hazards in the area. |
| ECP-15-000546, Rev. 0 | Evaluation to determine exclusion zone for phones and PCs | 10/8/15 | BOP/TB-3 | This engineering evaluation determined the exclusion zones for Wi-fi access in the power block to support VoIP phones and PCs. |
| ECP-15-000649 | Upgrade from NAS to VNX Server and removal of HP servers | 12/22/15 | BOP/TSC-1M | This change upgrades the NAS file server to a VNX file server and removes HP file servers to allow for increased storage capacity on the S and H Network Drives. |
| ECP-16-000806 | Install new multi frequency DAS system | 11/13/2017 | ABI/IBS-1, ABI/IBN-1, BOP/TB-1, BOP/AVT, BOP/SB-1WT, ABBM/ABB | This ECP will install a new fiber radio amplifier system which will help distribute the radio signal across the plant. This is an enhancement to the existing radio system. |
| ECP-18-000200 Rev. 0 | Technical Evaluation for Tear in Hemyc Wrap HWCB03 | 3/28/2018 | BR1B | The purpose of this evaluation was to determine the temperature in the area of the Hemyc wrap tear documented in IR04108798. It was determined that a postulated fire would not damage the cabling in the torn area due to the location of the tear based on temperatures below 205 $^0$C for a minimum of 27 minutes.<br>In accordance with ECP-18-000200-309-101-01, the area near the Hemyc wrap tear reaches a maximum temperature of 101 $^0$C at 30 minutes. These values are less than the damage temperature of thermoplastic cables (i.e. 205 $^0$C), and therefore, the tear is considered acceptable without repair. |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| RC<br>RC-1 | FRP-1.0 Containment Basement | Y | Y | Floor drains/sump which route to monitored Waste Hold up tank | Ventilation includes a containment shutdown purge system that is independent of the Auxiliary Building main plant vent and discharges through charcoal and HEPA filter units via the building exhaust vent. Ventilation is secured in forefront of FRP-1.0, and Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-1.0 was revised to include RPs to monitor for potentially contaminated fire suppression water. Also a note was revised for heightened awareness that contaminated products of combustion and fire suppression water runoff may result. PPE requirement already included. | Y |
| RC<br>RC-2 | FRP-2.0 Containment Intermediate Fl | Y | Y | Floor drains/sump which route to monitored Waste Hold up tank | Ventilation includes a containment shutdown purge system that is independent of the Auxiliary Building main plant vent and discharges through charcoal and HEPA filter units via the building exhaust vent. Ventilation is secured in forefront of FRP-2.0, and Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-2.0 was revised to include RPs to monitor for potentially contaminated fire suppression water. Also a note was revised for heightened awareness that contaminated products of combustion and fire suppression water runoff may result. PPE requirement already included. | Y |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| RC<br>RC-3 | FRP-3.0 Containment Operating Floor | Y | Y | Floor drains/sump which route to monitored Waste Hold up tank | Ventilation includes a containment shutdown purge system that is independent of the Auxiliary Building main plant vent and discharges through charcoal and HEPA filter units via the building exhaust vent. Ventilation is secured in forefront of FRP-3.0, and Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-3.0 was revised to include RPs to monitor for potentially contaminated fire suppression water. Also a note was revised for heightened awareness that contaminated products of combustion and fire suppression water runoff may result. PPE requirement already included. | |
| ABBM<br>ABB | FRP-4.0 Auxiliary Building Basement | Y | Y | Floor drains/sump which route to monitored Waste Hold up tank | The Aux Bldg ventilation system exhausts air from the equipment rooms and open areas of the aux and intermediate buildings, the decon pit area, and spent fuel pool area through a closed exhaust system with HEPA and charcoal filters, prior to being discharged to the plant vent.<br>Ventilation is secured in forefront of FRP-4.0, and Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-4.0 was revised to include RPs to monitor for potentially contaminated fire suppression water. Also a note was revised for heightened awareness that contaminated products of combustion and fire suppression water runoff may result. PPE requirement already included. | Y |

| Area Zone | Fire Response Plan/Title | RCA or | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| ABBM ABM | FRP-5.0 Auxiliary Building Intermediate Floor | Y | Y | Floor drains/sump which route to monitored Waste Hold up tank | The Aux Bldg ventilation system exhausts air from the equipment rooms and open areas of the aux and intermediate buildings, the decon pit area, and spent fuel pool area through a closed exhaust system with HEPA and charcoal filters, prior to being discharged to the plant vent.<br>Ventilation is secured in forefront of FRP-5.0, and Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-5.0 was revised to include RPs to monitor for potentially contaminated fire suppression water. Also a note was revised for heightened awareness that contaminated products of combustion and fire suppression water runoff may result. PPE requirement already included. | Y |
| ABI ABO | FRP-6.0 Auxiliary Building Operating Floor | Y | Y | Floor drains/sump which route to monitored Waste Hold up tank | The Aux Bldg ventilation system exhausts air from the equipment rooms and open areas of the aux and intermediate buildings, the decon pit area, and spent fuel pool area through a closed exhaust system with HEPA and charcoal filters, prior to being discharged to the plant vent.<br><br>Ventilation is secured in forefront of FRP-6.0, and Radiation Protection provides scene coverage. | There is a potential for a release through doors SD/26, SD/27, SD/28 and SD/29F, however FRP-6.0 was revised to install flood barriers associated with these doors. | The fire brigade has been trained on the use of these flood barriers as documented in FFB05C.<br>SC-3.17 was revised to include using flood barriers for the prevention of contamination spread.<br><br>Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-6.0 was revised to include RP to monitor for potentially contaminated fire suppression water, and the installation of flood barriers as needed. Also include a note for heightened awareness that contaminated products of combustion and fire suppression water runoff may result. PPE requirement already included. | Y |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| ABI IB-0 | FRP-7.0 Intermediate Building Sub-Basement | Y | Y | Floor drains/drain boxes/sump which route to monitored Retention tank | A supply fan exhausts air from the intermediate building cleanside to the intermediate building restricted area side. Exhaust fans draw ventilation air from various areas of both the clean and restricted area sides of the intermediate building and discharge to the auxiliary building discharge header plant vent duct. Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-7.0 was revised to include RP to monitor for potentially contaminated water. PPE requirements also included. | Y |
| ABI IBS-1 | FRP-8.0 Intermediate Building Controlled Side Basement | Y | Y | Floor drain/sump which route to monitored Waste Hold up tank | A supply fan exhausts air from the intermediate building cleanside to the intermediate building restricted area side. Exhaust fans draw ventilation air from various areas of both the clean and restricted area sides of the intermediate building and discharge to the auxiliary building discharge header plant vent duct. Ventilation is secured in forefront of FRP-8.0, and Radiation Protection provides scene coverage in FRP-8.0. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-8.0 was revised to include RP to monitor for potentially contaminated water. PPE requirements also included. | Y |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| ABI IBS-2 | FRP-9.0 Intermediate Building Controlled Side Operating Floor | Y | Y | Floor drains/sump which route to monitored Waste Hold up tank | A supply fan exhausts air from the intermediate building cleanside to the intermediate building restricted area side. Exhaust fans draw ventilation air from various areas of both the clean and restricted area sides of the intermediate building and discharge to the auxiliary building discharge header plant vent duct.<br>Ventilation is secured in forefront of FRP-9.0, and Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-9.0 was revised to include RP to monitor for potentially contaminated water. PPE requirements also included. | Y |
| ABI IBS-3 | FRP-10.0 Intermediate Building Controlled Side Top Floor | Y | Y | Floor drains/sump which route to monitored Waste Hold up tank | A supply fan exhausts air from the intermediate building cleanside to the intermediate building restricted area side. Exhaust fans draw ventilation air from various areas of both the clean and restricted area sides of the intermediate building and discharge to the auxiliary building discharge header plant vent duct.<br><br>Ventilation is secured in forefront of FRP-10.0, and Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-10.0 was revised to include RP to monitor for potentially contaminated water. PPE requirements also included. | Y |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| ABI IBN-1 | FRP-11.0 Intermediate Building Clean Side Basement | N | N | N/A | N/A | N/A | N/A | Not Required |
| ABI IBN-2 | FRP-12.0 Intermediate Building Main Steam Header Floor | N | N | N/A | N/A | N/A | N/A | Not Required |
| ABI IBN-3 | FRP-13.0 Intermediate Building Clean Side Fan Floor | N | N | N/A | N/A | N/A | N/A | Not Required |
| ABI IBN-4 | FRP-14.0 Intermediate Building Clean Side Top Floor | N | Y | Floor drains/sump which route to monitored Waste Hold up tank | A supply fan exhausts air from the intermediate building cleanside to the intermediate building restricted area side. Exhaust fans draw ventilation air from various areas of both the clean and restricted area sides of the intermediate building and discharge to the auxiliary building discharge header plant vent duct.<br>Ventilation is secured in forefront of FRP-14.0, and Radiation Protection provides scene coverage. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-14.0 was revised to include RP to monitor for potentially contaminated water. PPE requirements also included. | Y |
| CT CT | FRP-15.0 Cable tunnel | N | N | N/A | N/A | N/A | N/A | Not Required |
| BR1A BR1A | FRP-17.0 Battery Room A | N | N | N/A | N/A | N/A | N/A | Not Required |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| BR1B BR1B | FRP-18.0 Battery Room B | N | N | N/A | N/A | N/A | N/A | Not Required |
| CC RR | FRP-19.0 Relay Room /Multiplexer Room/Annex Room | N | N | N/A | N/A | N/A | N/A | Not Required |
| CC CR | FRP-20.0 Control Room | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP TB-1 | FRP-21.0 Turbine Building Basement | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP TB-2 | FRP-22.0 Turbine Building Intermediate Floor | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP TB-3 | FRP-23.0 Turbine Building Operating Floor | N | N | N/A | N/A | N/A | N/A | Not Required |
| EDG1A EDG1A | FRP-24.0 Diesel Generator Room A and Vault | N | N | N/A | N/A | N/A | N/A | Not Required |
| EDG1B EDG1B | FRP-25.0 Diesel Generator Room B and Vault | N | N | N/A | N/A | N/A | N/A | Not Required |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| BOP TO | FRP-26.0 Oil Storage Room | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP H2 | FRP-27.0 Secondary Hydrogen Bottle House | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP AVT | FRP-28.0 All Volatile Treatment Room (AVT) | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP/ TSC-1M, TSC-1N, TSC-1S | FRP-29.0 Technical Support Center | N | N | N/A | N/A | N/A | N/A | Not Required |
| SH SH-1 | FRP-30.0 Screenhouse Basement | N | N | N/A | N/A | N/A | N/A | Not Required |
| SH SH-2 | FRP-31.0 Screenhouse Operating Floor | N | N | N/A | N/A | N/A | N/A | Not Required |
| YARD YARD | FRP-32.0 Transformer Yard | N | N | N/A | N/A | N/A | N/A | Not Required |
| ABI N2 | FRP-33.0 Primary Nitrogen Bottle House | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP H2 | FRP-34.0 Primary Hydrogen Bottle House | N | N | N/A | N/A | N/A | N/A | Not Required |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| SAF SAF | FRP-35.0 Standby Auxiliary Feedwater Building | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP SB-1, SB-1HS, SB-1WT | FRP-36.0 Service Building Basement | Y | Y | Floor drains for areas containing contaminated material are connected to a monitored tank with the exception of the Hot Shop. The Hot Shop is not equipped with floor drain and as a result, there is a potential for a release through door SD/40 to Service Building sewage pumps. | Air from areas of potential contamination, are exhausted through the controlled intermediate building controlled access area exhaust fans that discharge air to the Auxiliary Building HEPA filter vent, which is exhausted to the plant discharge header. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-36.0 was revised to include necessary PPE, RP coverage, actions to protect Service Building Sewage pump area from water runoff, and a contingency plan to dilute. | Y |
| BOP SB-2 | FRP-36.1 Service Building Main Floor | Y | Y | Floor drains for the Daily Hot Lab and Count Room are connected to a monitored tank. | Air from areas of potential contamination, are exhausted through the controlled intermediate building controlled access area exhaust fans that discharge air to the Auxiliary Building HEPA filter vent, which is exhausted to the plant discharge header. | The Fire Response Procedures for plant areas and site buildings which may contain radioactive sources or contamination were enhanced to reinforce the potential for radioactive releases to unrestricted plant areas or to the environment. This includes potentially contaminated products of combustion and fire suppression water runoff. | Fire Brigade Lesson Plan FBP15 and FFB05C have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-36.1 was revised to include necessary PPE and RP coverage. | Y |

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| WS<br>WS | FRP-37.0 Contaminated Storage Building | Y | Y | Floor drains connected to a non functioning sump<br><br>FRP-37.0 to install flood barriers as needed. | Ventilation restrictions are not required. Fire Brigade to use SCBAs and dosimetry. External and TEDE dose to public calculated to be less than the 10CFR20 regulatory limit. Radiation Protection provides scene coverage in FRP-37.0. | The potential exists for a radioactive release much less than the 10CFR20 regulatory limit from this building to Lake Ontario. Procedure has been revised to install flood barrier to prevent the spread of contaminants to Auxiliary Building through door S29F. | The fire brigade is trained on the use of these flood barriers as documented in FFB05C.<br><br>SC-3.17 was revised to include using flood barriers for the prevention of contamination spread.<br><br>FRP-37.0 was revised to include necessary PPE, stay times, and RP coverage, and the installation of flood barriers as needed. | Y |
| PA<br>PA-NE | FRP-38.0 Nuclear Assessment Building | Y | Y | Floor drains located on lower level of NAB, however not in the RCA | Ventilation is secured in the forefront of FRP-38.0. Fire Brigade to use SCBAs and dosimetry. Radiation Protection provides scene coverage in FRP-38.0. | The potential exists for a radioactive release, however it was calculated to be much less than the 10CFR20 regulatory limit. | Fire Brigade Lesson Plan FBP15 and FFB05 have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-38.0 was revised to include necessary PPE, stay times, ventilation requirements, and RP coverage | Y |
| PA<br>PA-NE | FRP-39.0 Upper Radwaste Building | Y | Y | Floor Drain has been plugged | Restrictions for start of ventilation to be within the 10CFR20 regulatory limit. Fire Brigade to use SCBAs and dosimetry with stay time restrictions. Radiation Protection provides scene coverage in FRP-39.0. | The potential exists for a radioactive release, however it was calculated to be much less than the 10CFR20 regulatory limit. | Fire Brigade Lesson Plan FBP15 and FFB05 have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-39.0 was revised to include necessary PPE, stay times, ventilation restriction, and RP coverage. | Y |
| PA<br>PA-NW | FRP-40.0 Engineering Bldg | N | N | N/A | N/A | N/A | N/A | Not Required |
| PA<br>PA-NW | FRP-41.0 Pole Barn | N | N | N/A | N/A | N/A | N/A | Not Required |

## Radioactive Release Transition

| Area Zone | Fire Response Plan/Title | RCA or RCZ? | Screen In? | Engineering Controls Water | Engineering Controls Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| PA<br>PA-SW | FRP-42.0<br>Butler Building | Y | Y | No Floor Drains | Ventilation restrictions are not required. Fire Brigade to use SCBAs and dosimetry with stay time restrictions. External and TEDE dose to public calculated to be less than the 10CFR20 regulatory limit. Radiation Protection provides scene coverage in FRP-42.0. | The potential exists for a radioactive release, however it was calculated to be much less than the 10CFR20 regulatory limit | Fire Brigade Lesson Plan FBP15 and FFB05 have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water.<br><br>FRP-42.0 was revised to include necessary PPE, stay times, and RP coverage. | Y |
| PA<br>PA-SW | FRP-43.0<br>Off Loading Portal | N | N | N/A | N/A | N/A | N/A | Not Required |
| PA<br>PA-SW | FRP-44.0<br>L-Shape Building | N | N | N/A | N/A | N/A | N/A | Not Required |
| PA<br>PA-SW | FRP-45.0<br>Guardhouse | N | N | N/A | N/A | N/A | N/A | Not Required |
| ONSITE<br>ONSITE | FRP-47.0<br>Ginna Training Center | N | N | N/A | N/A | N/A | N/A | Not Required |
| ONSITE<br>ONSITE | FRP-47.1<br>Simulator Building | N | N | N/A | N/A | N/A | N/A | Not Required |

| Area Zone | Fire Response Plan/Title | RCA or | Screen In? | Engineering Controls Water | Smoke | Plan Review Results | Training Review Results | Meets NFPA 805 Performance Requirements? |
|---|---|---|---|---|---|---|---|---|
| STA13ACH STA13ACH | FRP-48.0 Station 13A Switchyard | N | N | N/A | N/A | N/A | N/A | Not Required |
| ONSITE ONSITE | FRP-49.0 Off-Site Warehouse | N | N | N/A | N/A | N/A | N/A | Not Required |
| ONSITE ONSITE | FRP-50.0 Off-Site Diesel Fuel Oil Storage Facility | N | N | N/A | N/A | N/A | N/A | Not Required |
| BOP GAB | FRP-51.0 Ginna Administration Building | N | N | N/A | N/A | N/A | N/A | Not Required |
| ABI CPB | FRP-52.0 Canister Preparation Building, ISFSI Transport and HSM Fire Response | Y | Y | Trenches and floor drains are piped to underground tank with sump and vault. Vault area pumped using portable sump. Tank and vault pumped to Auxiliary Building to the radwaste system | The CPB interfaces with the Auxiliary Building which exhausts air from the CPB through a closed exhaust system with HEPA and charcoal filters, prior to being discharged to the plant vent. Local HEPA/Fan unit in CPB is secured in FRP-52.0 upon confirmation of any fire. Radiation Protection provides scene coverage. | RPs monitor for potentially contaminated fire suppression water within FRP-52.0. PPE requirements are determined by RPs. | Fire Brigade Lesson Plan FBP15 and FFB05 have been implemented to include monitoring of potentially contaminated fire suppression products, identification of potential hazards, and containment of radiological water. | Y |
| ONSITE ONSITE | FRP-53.0 Radioactive Material (RAM) Storage Facility | Y | Y | N/A<br>All contaminated equipment is stored within sealed metal containers. | N/A | RPs monitor for potentially contamined fire suppression water within FRP-53.0. | N/A | Y |

| Item | Problem Statement | Proposed Modification | In FPRA | Status |
|---|---|---|---|---|
| 1 | During a fire, the CSTs can spuriously make-up to the Hotwell which can cuase the failure of the preferred AFW pumps. There are three power feeds that are not protected by the LC-107 bi-stable. If power is lost to these and TB29 and C3584 still have power, then the CST inventory will be drained to the hot well. This can lead to a loss of NPSH for the preferred AFW pumps. | ESR-12-0123: Modify the Hotwell Control Circuit such that no losses of power or fire effects on the Hotwell level transmitter loops would cause a spurious make-up (i.e. dumping the CST inventory into the Hotwell) | Yes | Complete. ECP-13-000703 |
| 2 | Fires in the Control Complex (CC:Battery Rooms, AHR, Relay Room , and Main Control Room) or Cable Tunnel (CT) can cause a false high Pressurizer (PZR) Pressure Signals on Multiple Channels | ESR-12-0125: Install a panel in the main control room, ouside of the zone of influence of other main control room panels that contain post trip critical safety function related equipment, with indication from two Reactor Coolant System pressure channels protected from the effects of a fire in the Control Complex or in the cable tunnel. | Yes | Complete. ECP-15-000528 |
| 3 | Fires in the Control Complex (CC: Battery Rooms, AHR, Relay Room, and Main Control Room) or Cable Tunnel (CT) can cause a false high steam generator (SG) level on multiple channels. | ESR-12-0125: Install a panel in the main control room, outside of the zone of influence of other main control room panels that contain post trip critical safety function related equipment, with indication from two steam generator level channels protected from the effects of a fire in the Control Complex or in the cable tunnel. | Yes | Complete. ECP-15-000528 |
| 4 | Fires in the Control Complex (CC: Battery Rooms, AHR, Relay Room, and Main Control Room) or Cable Tunnel (CT) can cause high steam demand following a reactor trip and fail the MSIVs. Although there are many cables of concern in the steam dump area, the primary cables of concern in the turbine trip are E212 and E215. These power the EHC dump valves and MSIV vent valves. These circuits are co-located in many areas. | ESR-12-0125: Provide automatic closure of the main steam isolation valves (MSIVs) on 2 out of 2 low steam generator level channels OR 2 out of 2 low Reactor Coolant Pressure channels. This function is protected from the effects of a fire in the Control Complex or in the cable tunnel. | Yes | Complete. ECP-15-000528 |
| 5 | Fires in Battery Room B can disable Train A equipment. NFPA 805 does not allow credit for cable wrap without a current revised design evaluation. | ESR-12-0142: Ensure the Hemyc HWCB03 is adequate or upgraded to provide protection of cables L0318, C0687, and part of cable E0053 against fire-induced damage in case of a fire in Battery Room B. | Yes | Complete. Analysis 0028-0018-000-001 and work order C92936867 resolved issue. |
| 6 | Many fire scenarios disable the preferred AFW pumps and fail the DGs. This can be due to loss of NPSH as the CSTs are dumped to the hot well, damage to TD Pump MOVs by a fire that prevent manual recovery, lack of steam for the TD AFW pump due to SG blow down, or loss of power situations. ESR-11-0050 will provide a single DG to power a Standby AFW pump. | ESR-12-0143: Provide an additional diesel generator that is capable of supporting a new RCS injection pump, 1 SB AFW pump, and the battery chargers. | Yes | Complete. ECP-12-000459 ECP-13-000995 |

| Item | Problem Statement | Proposed Modification | In FPRA | Status |
|---|---|---|---|---|
| 7 | Fire could cause a LOCA and disable the charging pumps and safety injection equipment. Although procedures are in place to prevent a LOCA by removing power, it is possible that the equipment once opened (e.g. the PORVs) fails to close after being open. If no power is available (e.g. the DGs are failed), then having an alternative form of injection is important. | ESR-12-0144: This modification consists of installing a new standby injection pump in the SBAFW building with a manually initiated source of borated water not prevented by a fire in the Control Complex, Auxiliary Building, Intermediate Building, Turbine Building, Containment or Screen House. In addition, a portable diesel driven pump will be available with the same performance capabilities as the permanently installed injection pump. The portable pump will use the same basic suction and discharge paths as the permanent pump through the use of installed hose connections. The portable pump can be connected if the permanent pump were to fail. | Yes | Complete. |
| 8 | Significant testing and modeling has shown a high reactor coolant leak rate from the RCP seals during a loss of all seal cooling event (e.g., Station Black Out). The high Core Damage Frequency (CDF) in Ginna PRA modeling. The newly developed shutdown seal will limit reactor coolant leak rate to approximately 1 gpm. This would produce a significant benefit to the PRA model. There are no issues with the current Reactor Coolant Pump seals. The new shutdown seal will eliminate vulnerability. | ESR-11-0305: Install upgraded seals for the reactor coolant pumps. | Yes | Complete.<br>ECP-15-000522 |
| 9 | For events involving loss of all AC power (Station Blackout), only the turbine-driven pump is available to provide decay heat removal. In addition, the turbine driven pump is credited for the decay heat removal function for fires in seven (7) fire areas: Auxiliary Building Basement/Mezzanine, Control Complex, Cable Tunnel, Emergency Diesel Generator 1A Area, Emergency Diesel Generator 1B Area, Reactor Containment and the Standby Auxiliary Feedwater Pump Building. As such, the turbine-driven AFW train has greater safety significance than the AC motor driven trains, making its functional reliability or failure of greater importance. The higher safety significance of the turbine-driven pump train could render the plant vulnerable to losing decay heat removal during station blackout and certain fire events. The objective of this modification is to reduce reliance on the turbine driven pump during station blackout and fire events. | ESR-11-0050: To withstand the effects of a fire that occurs outside of the SB AFW Building, provide a water source that will be free of the fire effect and supported by a DG in the SB AFW Building. | Yes | Complete. |

| Item | Problem Statement | Proposed Modification | In FPRA | Status |
|---|---|---|---|---|
| 10 | DGAELCP indicating lights circuit may short in a fire and fail power to DG A start circuit and also to the DG Fuel Oil Transfer Pumps. | ESR-12-0412: Provide fusing for the breaker position indicating light circuit in DG A emergency local control panel DGAELCP. | Yes | Complete. ECP-13-001028 |
| 11 | A potential fire in the Turbine Building could cause the Diesel Fire Pump to fail due to fire effects on the remote start circuit. | ESR-11-0421: Modify the Diesel Fire Pump Control Panel circuit to isolate the remote start circuit from the Diesel Fire Pump Control Panel Microcontroller. | No | Complete. ECP-13-000702 |

## Table B-3 – NFPA 805 Ch 4 Compliance (NEI 04-02 Table B-3)

| | | |
|---|---|---|
| **Fire Area ID:** | ABBM - Auxiliary Building Basement/Mezzanine | **Fire Area Definition** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Fire Zone ID | Description |
|---|---|
| ABB | 235'-8" Auxiliary Bldg Basement Floor |
| ABM | 253'-0" Auxiliary Bldg Mezzanine Floor |

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train "A" CVCS success path from the RWST to the RCS<br>o Train "A" SIS success path from the RWST to the RCS and the PORV associated with the "A" nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG "A":<br>o TDAFW Pump success path from the SG "A" MSS and pump suction from the CST or SWS | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | o SAFW Pump “C” success path from the SWS or FPS | |
| 5. Process Monitoring Function | RCS Temperature:<br>TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System.<br>• AC Power availability is maintained by train “A” Diesel-Generator and train “A” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train ”A” SWS success path or alignment of alternate cooling from the FPS to the “A” Diesel.<br>• Except for a Control Room fire, train “A” CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

(ABB)

Scenario 1: Suppression Effects in ABB of a Fire Originating In ABB:

Suppression effects (activation of preaction sprinkler system S01 and manual firefighting) are not expected to extend beyond the area of fire origin. Preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box, and would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in ABB of a Fire Originating Outside of ABB

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Since preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box, operation of a fire suppression system outside of ABB could not impact fire suppression systems within ABB. Similarly, manual firefighting activities outside of ABB would not be expected to affect equipment/components located within ABB.

(ABM)

Scenario 1: Suppression Effects in ABM of a Fire Originating In ABM:

Suppression effects (activation of Charcoal Filter Unit G deluge system S02, preaction and wet-pipe sprinkler systems S04, S35 and S36 or manual firefighting are not expected to extend beyond the area of fire origin. Water spray from the deluge system is expected to be substantially contained within the filter unit and contained by the equipment or floor drain systems. Preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box. The activation of a preaction or wet-pipe sprinkler system would only be expected to activate small number of sprinklers. The only potentially vulnerable component in the area associated with suppression systems protecting other Fire Zones that could be affected by water discharge from S03 or manual firefighting is electric manual pull box S05MX at the Auxiliary Building entrance to the Cable Tunnel. The extent of consequences expected would be shorting out the switch and discharge of water to the Cable Tunnel, Fire Zone CT which contains only safe shutdown related cables (no SSD components). Based on assumption 3, the safe shutdown related cables would not be damaged by water discharge.

Scenario 2: Suppression Effects in ABM of a Fire Originating Outside of ABM:

Charcoal Filter Unit G deluge system S02 is actuated by the associated fire detection system in the area which could be vulnerable to a fire originating outside ABM if the detection circuits and/or control panel are routed or located outside the fire zone (e.g., SSA in the Relay Room). However, water is expected to be substantially contained by the filter unit and drainage system. Since preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box, operation of a fire suppression system outside of ABM could not impact preaction fire suppression systems within ABM. Since automatic wet-pipe sprinkler systems are not electrically activated, operation of a fire suppression system outside of ABM could not impact automatic wet-pipe sprinkler systems within ABM. Similarly, manual firefighting activities outside of ABM would not be expected to affect equipment/components located within ABM.

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R, S | Modifications: R S<br>Procedures/Recovery Actions: R |
| ABB | 235'-8" Auxiliary Bldg Basement Floor | E | E, R | E, rr | Combustible Loading Controls: E<br>Detection System, Z01: E R<br>Detection System, Z02: E R<br>Detection System, Z02D1: E R<br>Floor drains/sump: rr<br>Procedural Controls Regarding Securing Ventilation: rr<br>Water Suppression, S01: E |
| ABM | 253'-0" Auxiliary Bldg Mezzanine Floor | E, R | E, R | E, rr | Combustible Loading Controls: E<br>Detection System, Z03: E R<br>Floor drains/sump: rr<br>Procedural Controls Regarding Securing Ventilation: rr<br>Water Suppression, S02: E R<br>Water Suppression, S03: E R<br>Water Suppression, S04: E R<br>Water Suppression, S35: E R<br>Water Suppression, S36: E R |

**Title** Fire Risk Evaluation for Fire Area ABBM

| | | |
|---|---|---|
| **Fire Area ID:** | ABBM - Auxiliary Building Basement/Mezzanine | **Fire Risk Evaluation** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Risk Summary**

The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-05/rx-yr for the delta CDF, and less than 1E-06/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF**

Units: [1] 1.09E-06

**Δ LERF**

Units: [1] 4.74E-09

**DID Maintained**

A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The fire detection (smoke) and suppression system (automatic pre-action) installed in Fire Zone ABM are credited in the Fire PRA for Compartment ABM-C1 (253 ft, intermediate open area). The Fire PRA also takes credit for the fire detection system installed in Fire Zone ABB to support manual suppression in Compartment ABB-C1 (253 ft, AB Basement open area). Given the relatively high fire frequency in the fire area, the fire suppression system in the Fire Zone ABB is credited for DID. Portable extinguishers and hose stations are credited by the Fire PRA in Compartments ABB-C1 and ABM-C1. In the rest of the fire area, they are available for fire brigade use and do not require additional DID enhancement. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

| | | |
|---|---|---|
| **Fire Area ID:** | ABBM - Auxiliary Building Basement/Mezzanine | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-ABBM-004

**VFDR**

Instrument Air to the CNMT is isolated (via 5397) by an unrelated operator action to mitigate spurious operation of AOVs inside CNMT. With Instrument Air isolated, and cable fire damage (R0542), credited Aux. Spray valve AOV-296 cannot be controlled from the MCB.
Local action is taken to operate AOVs 294 and 296 for RCS pressure control during cooldown by aligning the Service Air System to supply Instrument Air in the CNMT to support operation of 296 from the MCB. However, operator action to "de-power" 125V DC distribution panel DCPDPCB04A (which is credited to mitigate other spurious actuations) removes the necessary control power to operate these AOVs from the MCB.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP017, OP307, PC315]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 294 - CHRG TO LOOP B CL (AOV) {R0535(LOI)}
CVC - 296 - AUX SPRAY AOV {R0542(LOI)}
PSA - 7141 - SA MIDDLE ISOL VLV TO CONTAINMENT (INTER BLDG) {Requires Operator Action}
PSA - 7222 - SA OUTER ISOL VLV TO CONTAINMENT (INTER BLDG) {Requires Operator Action}
PSA - 7227 - SA ISOL VLV (IN CNMT) {Requires Operator Action}
PSA - 7227A - SA TO IA CROSSTIE ISOLATION VALVE INSIDE CONTAINMENT {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-ABBM-005

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.
Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 294, 296, 4297, 4298, 9710A, 9710B and align long-term air supply to the credited CHG Pump (PCH01A)). However, this action may not be successful due to the integrity of instrument air piping.

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH308, PH331]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue.

**Component(s)**

IAS - 7009A - IA ISOL VLV TO CHARGING PUMP A CONTROLS {Requires Operator Action, Component in FA}
IAS - 7009B - IA ISOL VLV TO CHARGING PUMP B CONTROLS {Requires Operator Action, Component in FA}
IAS - 7009D - INST AIR QUICK DISCONNECT ISOL VALVE FOR CHARGING PUMP A {Requires Operator Action, Component in FA}
LAC - BUS13 - 480V SWITCHGEAR {L0327(LO), L0331(LO), L0177(LOCI), L0178(LOCI), L0329(LOCI), L0328(P), Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {L0187(LO), L0317(LO), L0198(LOC), L0004(LOCI), L0005(LOCI), L0024(P), L0079(P), L0197(P), Cascading Impact}
PSA - 14005H - SA ISOL VLV {Requires Operator Action, Component in FA}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-ABBM-006

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**VFDR**

If offsite power is available, fire damage to 125V DC control cabling can prevent stopping RCP "A" and/or RCP "B" from the MCB or restart the pump(s) if successfully tripped. The pump(s) continuing to run, or restarting, could have an adverse impact on controlling the RCS cooldown rate.
Local action is taken to secure the affected RCPs at the appropriate 4KV AC breakers.
This VFDR is associated with the Decay Heat Removal Function. [OP017, PH309, PH312].
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

RCS - PRC01A - RCP A {C1281(L), M0050(LC)}
RCS - PRC01B - RCP B {C1370(L), M0145(LC), M0140(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-007

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**VFDR**

The CHG pump suction isolation valve (AOV-112C) from the VCT is required closed to allow the RWST to supply highly borated water to the pump. However, AOV-112C fails open on a loss of IA (deterministic assumption) OR cannot be closed due to fire damaged cables resulting in VCT inventory loss, CHG pumps drawing suction from the VCT cover gas instead of the RWST and consequent failure of the credited CHG Pump (PCH01A). Fire damage to cables also prevents operation of PCH01A from the MCB; the pump can spuriously start after being stopped or cannot be stopped when running.
Local action is taken to isolate the VCT cover gas supply so that the RWST head pressure would override the VCT head pressure and cause check valve (V-266) closure. However, manual valves requiring this HSD action are located within the fire area under consideration. Additionally, "Fire damage to manual valves should be evaluated with respect to the ability to manually operate as a part of the post-fire safe shutdown scenario." (Reference NEI 00-01, Section 3.2.1.2)
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OE005, OP017, PH315]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 112C - VCT OUTLET AOV {R0056(LC), R0063(LC), R0060(LCI), R0061(LI), R0062(LI), Component in FA}
CVC - 261 - VCT H2 INLT MANUAL BLK VLV {Requires Operator Action, Component in FA}
CVC - 262 - VCT NITROGEN INLET MANUAL BLK VLV {Requires Operator Action, Component in FA}
CVC - PCH01A - CHRG PUMP A {L0400C(L), L0399(LOCI), L0400(LOCI), E0063(P), E0064(P), E0307(P), L0398(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

| | | |
|---|---|---|
| **Fire Area ID:** | ABBM - Auxiliary Building Basement/Mezzanine | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-ABBM-008

**VFDR**

A MSO concern exists related to RWST Drain Down via Containment Sump. Containment sump MOVs (850A and 850B) are subject to spurious opening. MOV-856 is required to be closed to prevent RWST drain down to the sump during HSD. Fire damage to cable C0790 can spuriously open 856, bypassing the control power key switch (1/856-KS on MCB).
Local action is taken within the fire area under consideration to mitigate this spurious operation.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OP017, PH318]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

RHR - 850A - CNMT SUMP TO RHR PUMP MOV {C0703(LI), C0704(LOCI), C0702(P), E0061(P), E0061A(P), Component in FA}
RHR - 850B - CNMT SUMP TO RHR PUMP MOV {C1069(LI), C1070(LOCI), C1068(P), E0167(P), E0167A(P), Component in FA}
RHR - 856 - RWST TO RHR MOV {C0791(L), C0789(LI), C0790(LOCI), C0788(P), E0061(P), E0061A(P), Component in FA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID** VFDR-ABBM-009

**VFDR**

A MSO concern exists related to loss of BUS14 and BUS18. The scenario is postulated due to the following separation concerns:
(a) On a LOOP (deterministic assumption) fire damage to cables can prevent credited KDG01A from starting. Both “A” (L0365 or L0780) and “B” (L0782) DG start circuits are impacted preventing automatic DG start. This affects BOTH BUS14 and BUS18.
(b) Spurious opening or failure to close of breaker 52/EG1A1 (cable L0319) and spurious opening of 52/14 (cable L0315), if offsite power is available, results in a loss of power to credited BUS14.
Local action is taken to mitigate the spurious operation as follows:
(a) Strip the loads off BUS14 (BUS18 can be stripped from the MCB)
(b) Transfer control circuitry and place KDG01A in service at the DGAELCP. However, fire damage to common power cable (L0365) prevents the DG from being started locally at the DGAELCP

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**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

(c) After KDG01A has been started, load BUS14
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP021, PH319, PH323, PH326, PH335]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

ABV - AAF04 - AUXILIARY BUILDING EXHAUST FAN G {L0644(L), G0488A(LC), L0643(LCO), G0947(LO), L0647(LO), L0647A(LO), L0732(LO), G0490A(LOI), E0063(P), E0064(P), L0641(P)}
AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {L0374(L), L0372(LOCI), E0063(P), E0064(P), L0371(P)}
AFW - PSF01A - SAFW PUMP C {FWL0010(LI), L0744(LO), E0063(P), E0064(P)}
CCW - PAC02A - CCW PUMP A {L0284(LC), L0395(LOCI), E0063(P), E0064(P), L0394(P)}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A {L0337(LOCI), E0063(P), E0064(P), L0336(P)}
CVC - PCH01A - CHRG PUMP A {L0400C(L), L0399(LOCI), L0400(LOCI), E0063(P), E0064(P), E0307(P), L0398(P)}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0185(LC), L0319(LOCI), E0063(P), E0064(P), L0318(P)}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0780(LC), L0782(LC)}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0185(LC), L0315(LOCI), E0063(P), E0064(P)}
LAC - BUS14 - 480V SWITCHGEAR {L0185(LC), L0776(LO), L0315(LOCI), L0319(LOCI), L0329(LOCI), E0063(P), E0064(P), L0318(P), L0328(P)}
LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOC), E0061(P), E0061A(P), E0063(P), E0064(P)}
LAC - UVBUS14 - BUS 14 UV CIRCUITRY {E0274B(), L0312(), L0681(), L0684(), L0686(), L0687(), L0688(), L0689(), L0876A()}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), C2205(P), C2206(P), C2207(P), C2208(P), C2209(P), C2210(P), C2211(P), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P)}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), C2212(P), C2213(P), C2214(P), C2215(P), C2216(P), C2217(P), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P)}
RCV - ACF08A - CONTAINMENT RECIRCULATING FAN A {L0352(LOCI)}
RCV - ACF08D - CONTAINMENT RECIRCULATING FAN D {L0363(LOCI)}
RHR - PAC01A - RHR PUMP A {L0378(LOCI), E0063(P), E0064(P), L0377(P)}
SIS - PSI01A - SI PUMP A {L0333(LOCI), E0063(P), E0064(P), L0332(P)}
SIS - PSI01C - SI PUMP C {L0211(LC), L0706(LO), L0210(LOCI), L0325(LOCI), E0063(P), E0064(P), E0168(P), E0169(P), L0209(P), L0324(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at

least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-ABBM-010

**VFDR**

A separation concern exists related to operability of the credited CHG Pump (PCH01A). The CHG Pump suction source can be lost with VCT outlet valve AOV-112C spuriously closing due to fire damage to cables (R0056, R0063 and/or R0060) and RWST to CHG Pump suction valve AOV-112B remaining closed due to fire damaged cables (R0056A, R0056 and/or R0061). Additionally, cable fire damage can result in loss of control of PCH01A from the MCB.
Local action is taken to establish CHG Pump control and flow path (open V-358, transfer controls at ABELIP and start PCH01A at the ABELIP).
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OP017, OP301, PH329]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {R0056A(LO), R0061(LO), R0056(LOI)}
CVC - 112C - VCT OUTLET AOV {R0056(LC), R0063(LC), R0060(LCI), R0061(LI), R0062(LI)}
CVC - 289 - CHARGING PUMPS DISCHARGE ISOL VLV TO RCP SEAL INJECTION {Requires Operator Action }
CVC - 358 - CHARGING PUMP SUCTION FROM RWST MANUAL IV {Requires Operator Action }
CVC - PCH01A - CHRG PUMP A {L0400C(L), L0399(LOCI), L0400(LOCI), E0063(P), E0064(P), E0307(P), L0398(P)}
IAC - ABELIP - AUX BLDG EMERG LOCAL INSTR PANEL {E0305(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID** VFDR-ABBM-011

**VFDR**

Cable fire damage results loss of control of non-credited components associated with BUS16. Maintaining BUS16 energized could result in non-credited undesired pumps running adversely impacting a controlled shutdown.
Local action is taken to isolate the normal MAC power supply to BUS16. However, BUS16 can remain energized through:

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**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

(a) Non-credited DG (KDG01B) when offsite power is not available, since no prescribed action exists to secure the non-credited EAC System path by locally tripping KDG01B - OR -
(b) Spurious closure of 52/BT16-15 (fire damage to cable L0198) with BUS16 being fed from BUS15 when offsite power is available
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP309, PH330, OMH702]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

EAC - KDG01B - DIESEL-GENERATOR B {L0786(L), L0784(LC)}
LAC - 52/15 - BKR FOR BUS 15 SUPPLY {L0198(LC)}
LAC - 52/BT16-15 - BREAKER FOR BUS 16 TO BUS 15 TIE {L0703(LO), L0198(LOCI), E0168(P), E0169(P), L0197(P)}
LAC - BUS16 - 480V SWITCHGEAR {L0206(LC), L0700(LO), L0777(LO), L0203(LOC), L0184(LOCI), L0189(LOCI), L0198(LOCI), L0204(LOCI), E0168(P), E0169(P), L0188(P)}
MAC - 52/16SS - STATION SERVICE TRANSFORMER 16 SUPPLY {L0777(LO)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. Recovery Action CVHFDCHGTRIPFIRE, consisting of locally securing the charging pumps, is also credited. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABBM-012

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**VFDR**

Cable fire damage to CHG pump flow control valve AOV-142 (R0150) could result in an erroneous signal and spurious valve closure. Loss of the CHG flow path during shutdown would result in loss of the ability to make up and the loss of ability to borate the RCS.
Local action is taken to re-establish CHG flow by opening V-384C to bypass AOV-142. However, this valve is located in the fire area (AB Basement, behind RWST) requiring entry to perform a hot shutdown action. Additionally “Fire damage to manual valves should be evaluated with respect to the ability to manually operate as a part of the post-fire safe shutdown scenario." (Reference NEI 00-01, Section 3.2.1.2)
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OE005, OP017, PH332]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

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**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

CVC - 142 - CHRG FCV {R0150(I)}
CVC - 384C - AOV 142 BYP VLV {Requires Operator Action, Component in FA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABBM-013

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**VFDR**

The desired shutdown position of the Letdown Isolation valve (427) or the Letdown Orifice valves (200A, 200B, 202) during shutdown is closed. Fire damage to cables for valve 427 (R0215 or R0505) could cause the valve to fail open and for valves 200A (R0504 or 0509), 200B (R0500 or R0504 or R0509) and 202 (R0500 or R0503 or R0510) causes the valve(s) to spuriously open or remain open effectively causing a RCS inventory loss during shutdown.
Local actions are taken to mitigate the spurious operations as follows:
(a) Open breakers at DC power panel. However, operator action to 'de-power' circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit. - AND -
(b) Isolate IA to Containment causing the valves to fail closed. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, OE010, OP017, OP023, PH302, PH303, PH334]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Requires Operator Action}
CVC - 135 - LOW PRESS LTDN PRESS CONTROL VLV PCV-135 {PT-135-LINE(L), R0140(I), R0142(I)}
CVC - 200A - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), R0504(LOI), R0509(LOI)}
CVC - 200B - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), R0502(LOI), R0504(LOI)}
CVC - 202 - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), R0503(LOI), R0510(LOI)}

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**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

CVC - 427 - RCS LETDOWN ISOLATION {R0215(LCI), R0505(LC)}
IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-014

**VFDR**

Fire damage to 480V AC power cables C5191 and C5195 would render Battery Chargers A1 and B1 (respectively) unavailable to supply long-term power to components required to achieve safe and stable conditions in an orderly manner.
Local action is taken to align the TSC DC supply to provide power for long-term operation of:
(a) ABELIP and DG “A” Fuel Oil Transfer Pump (PDG02A), by aligning DCPDPCB02A
(b) IBELIP and TDAFW Pump DC LUBE OIL Pump (PLO11), by aligning DCPDPCB02B
This VFDR is associated with the Vital Auxiliaries Function. [PH336, PH337]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - PLO11 - TDAFWP DC LUBE OIL PUMP {Cascading Impact}
BDC - DCPDPCB01A - BATTERY A MAIN DISCONNECT {Operator Action required}
BDC - DCPDPCB01B - BATTERY B MAIN DISCONNECT {Operator Action required}
BDC - DCPDPCB02A - BATTERY A MAIN FUSE CABINET {Operator Action required}
BDC - DCPDPCB02B - BATTERY B MAIN FUSE CABINET {Operator Action required}
BDC - DCPDPCB05A - TSC BATTERY A FUSED DISCONNECT {Operator Action required}
BDC - DCPDPCB05B - TSC BATTERY B FUSED DISCONNECT {Operator Action required}
BDC - DCPDPCD01 - TSC BATTERY A & B FUSED DISCONNECT {Operator Action required}
BDC - DCPDPTB02 - TSC TO BATTERY A & B THROWOVER SWITCH {Operator Action required}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
IAC - ABELIP - AUX BLDG EMERG LOCAL INSTR PANEL {E0305(P)}
IAC - IBELIP - INTERMEDIATE BLDG EMERG LOCAL INSTR PANEL {Cascading Impact}
LAC - 52/15 - BKR FOR BUS 15 SUPPLY {L0198(LC)}

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

LAC - 52/BT16-15 - BREAKER FOR BUS 16 TO BUS 15 TIE {L0703(LO), L0198(LOCI), E0168(P), E0169(P), L0197(P)}
LAC - BUS15 - 480V SWITCHGEAR {L0703(LO), L0198(LOC), E0168(P), E0169(P), L0079(P), L0197(P)}
LAC - BUS16 - 480V SWITCHGEAR {L0206(LC), L0700(LO), L0777(LO), L0203(LOC), L0184(LOCI), L0189(LOCI), L0198(LOCI), L0204(LOCI), E0168(P), E0169(P), L0188(P)}
LAC - BYCA1 - BATTERY CHARGER A1 {C5191(P), Cascading Impact}
LAC - BYCB1 - BATTERY CHARGER B1 {C5195(P), Cascading Impact}
LAC - BYCTSC - TSC BATTERY CHARGER {Operator Action required}
LAC - KED03 - TSC EMERGENCY DIESEL-GENERATOR {Operator Action required}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions DCHFDTSCLT and FSHFDTSCLT-DR, respectively consisting of aligning the TSC diesel generator and the TSC battery charger or aligning the 100 kW diesel generator directly to either of the safety related battery chargers, were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-019

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**VFDR**

Procedure directed action to “de-power” circuits to mitigate spurious operation may not be effective. Action is taken at the MCB to de-energize circuits in 125V DC Panels (DCPDPCB04A and DCPDPCB04B) to fail components to their respective Loss Of Power position. As no additional local action is taken to assure the components remain in the desired position, subsequent fire-induced shorts to energized conductors of different circuits in conjunction with fire damage (grounds) could result in spurious operations.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OE010, OP017, OP022, PH302, PH303]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Requires Operator Action}
CVC - 110B - RMW FLOW CONTROL VLV AOV-110B {R0034B(LI), R0034C(LI), R0034A(LO), R0034(LOI)}
CVC - 110C - BLENDER OUTLET TO VCT (AOV) {R0035B(LI), R0035C(LI), R0035A(LO), R0035(LOI)}
CVC - 111 - RMW TO BA BLENDER FLOW CONTROL VLV HCV-111 {R0036B(LI), R0036C(LI), R0036A(LO), R0036(LOI)}
CVC - 123 - EXCESS LTDN FCV {R0077(LOC)}

CVC - 371 - RCS LETDOWN ISOLATION {R0569(LI), R0570(LI), R0571(LI), R0568(LO), R0567(LOI)}
CVC - 392A - CHRG TO LOOP B HL (AOV) {R0549(LOI)}
RCS - 591 - REACTOR HEAD VENT OUTER (SOV) TO 593 {SAC0216(L), SAC0214(LOI)}
RCS - 593 - REACTOR HEAD VENT INNER (SOV) TO 591 {SAC0216(L), SAC0212A(LOI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-021

**VFDR**

3-Phase proper phase rotation shorts must be considered for high/low pressure interface in-series valves MOVs 700, 701, 720, and 721 since power cabling for the valves is routed through this area. Reliance on de-powering to prevent spurious opening requires assurance that no three-phase cabling of the same or higher voltage is routed in the same raceway between the MCC and the valve. Spurious operation of these valves results in a high/low pressure system interface concern. Additionally; an IN 92-18 concern exists, as identified in DA-EE-2000-066 – Attachment G.
This VFDR is associated with the Inventory and Pressure Control Functions, and Decay Heat Removal Function. [OP001, OP002, OP017]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

RHR - 700 - RHR PUMP SUCTION FROM RCS MOV {C5044(L), C0722(LOCI), C0724(LOCI), C0720(P), C0720A(P), C5019(P), E0061(P), E0061A(P)}
RHR - 701 - RHR PUMP SUCTION FROM RCS {C5048(L), C1089(LOCI), C1091(LOCI), C1087(P), C1087A(P), C5026(P), E0167(P), E0167A(P)}
RHR - 720 - RHR DISCHARGE TO LOOP B {C5043(L), C0715(LI), C0717(LOCI), C0713(P), C0713A(P), C5018(P), E0061(P), E0061A(P)}
RHR - 721 - RHR DISCHARGE TO LOOP B {C5047(L), C1081(LI), C1083(LOCI), C1079(P), C1079A(P), C5025(P), E0167(P), E0167A(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the consideration that 3-phase proper polarity hot short are implausible. No recovery action was credited to resolve this VFDR.

**VFDR ID**

VFDR-ABBM-022

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|---|---|---|
| **Fire Area ID:** | ABBM - Auxiliary Building Basement/Mezzanine | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR**

A MSO concern exists related to spurious (ESF) Safety Injection Actuation. Actuation is possible due to fire damaged cabling resulting in a low PZR pressure signal with two out of three PZR pressure transmitters loops (PT-429 and PT-430) impacted.
This VFDR is associated with the Inventory and Pressure Control Functions. [OP017, OP005]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

RPS - PT-429 - PRZR PRESS XMTR {R1101(I), R3408(I), R1091(LI), R1096(LI)}
RPS - PT-430 - PRZR PRESS XMTR {R3973(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-023

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**VFDR**

A MSO concern exists related to inadvertent PORV (430/431C) actuation as follows:
I. PORV opening and spurious operation/failure of block valves
(a) PORVs (430 and 431C) spuriously open--when required closed for HSD--due to fire damage to SOV cables (8620A for 430; 8616B, 8619B and 8620B for 431C), - AND -
(b) Block valves (515 and 516) fail open or spuriously open after being closed due to cable fire damage
II. PORV opening due to high pressure signal
(a) High PZR pressure signal from PT-429 and a high PZR signal from channel 2 (PT-430) actuates 430
Local actions are taken to mitigate spurious operation as follows:
(a) Open breakers at DC power panel. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit. - AND -
(b) Isolate IA to Containment causing the valves to fail closed. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, OE010, OP008, OP011, OP017, PH302, PH303, PH334]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Requires Operator Action}
IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}
IAS - 8619B - N2 ARMING SOV FOR PORV 431C {SAC0212A(LO), SAC0212B(LO)}
IAS - 8620A - PORV 430 ACTUATION SOV {R0275(LO)}
IAS - 8620B - PORV 431C ACTUATION SOV {R0275(LO)}
NAS - 8616B - ACCUM TO SURGE TANK SOV FOR PORV 431C {SAC0214(LO)}
RCS - 430 - PORV (AOV) {R0275(LOI)}
RCS - 431C - PORV (AOV) {SAC0212A(LO), SAC0212B(LO), R0275(LOI)}
RCS - 515 - PORV BLOCK VALVE (MOV) FOR 431C {C1058(LI), C1060(LOCI), C1056(P), E0167(P), E0167A(P)}
RCS - 516 - PORV BLOCK VALVE (MOV) FOR 430 {C0692(LI), C0694(LOCI), C0690(P), E0061(P), E0061A(P)}
RPS - PT-429 - PRZR PRESS XMTR {R1101(I), R3408(I), R1091(LI), R1096(LI)}
RPS - PT-430 - PRZR PRESS XMTR {R3973(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-024

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**VFDR**

On a postulated LOOP, fire damage to HEMYC wrapped cabling (L0318), which is no longer considered "qualified" as a 1-hour rated fire barrier, results in a loss of 480V AC power to credited Train “A” BUS14 and BUS18. Fire damage to cable L0318 (multiple phase to ground or a phase to phase fault) results in loss of BUS14 (including MCCC fed via BUS14) and BUS18 challenging the capability to achieve safe and stable plant conditions.
This VFDR is associated with the Vital Auxiliaries Function. [OE012, OP311]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

AFW - PSF01A - SAFW PUMP C {FWL0010(LI), L0744(LO), E0063(P), E0064(P), Cascading Impact}
CVC - PCH01A - CHRG PUMP A {L0400C(L), L0399(LOCI), L0400(LOCI), E0063(P), E0064(P), E0307(P), L0398(P)}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0185(LC), L0319(LOCI), E0063(P), E0064(P), L0318(P)}

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0318(P)}
LAC - BUS14 - 480V SWITCHGEAR {L0185(LC), L0776(LO), L0315(LOCI), L0319(LOCI), L0329(LOCI), E0063(P), E0064(P), L0318(P), L0328(P)}
LAC - BUS18 - 480V SWITCHGEAR {L0206(LO), L0318(P)}
LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOC), E0061(P), E0061A(P), E0063(P), E0064(P)}
SWS - PSW01A - SERVICE WATER PUMP A {Cascading Impact}
SWS - PSW01C - SERVICE WATER PUMP C {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-025

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**VFDR**

A loss of charging capability is possible. The VCT can fill with high temperature water from RCP seal leakoff, via the Seal Water HX without CCW cooling, flashing steam in the VCT and causing VCT pressure to rise above head pressure of the RWST. When the CHG Pump is restarted, this can result in the pump drawing suction from the VCT (instead of the RWST), introducing saturated water and thereby damaging the CHG pump. This scenario is postulated due to the following separation concerns:
(a) Total loss of RCP seal cooling (Thermal Barrier AND Seal Injection) due to a LOOP (deterministic assumption) and loss of EAC power (credited KDG01A fails to start, while non-credited KDG01B is deterministically assumed to be unavailable), - AND -
(b) VCT isolation valve (AOV-112C) fails open on a loss of air (deterministic assumption) OR fire damaged cables prevents AOV-112C from closing, - AND -
(c) RCP seal leak-off isolation valve (MOV-313) fails open or spuriously reopens due to fire damaged cables (note, RCP Seal Outlet AOVs 270A and 270B should be maintained open for RCP #2 seal integrity).
Local action is taken to close V-315A and V-315C to isolate the Seal Return Filter. However, manual valves requiring HSD action are located within the fire area under consideration. Additionally, “Fire damage to manual valves should be evaluated with respect to the ability to manually operate as a part of the post-fire safe shutdown scenario." (Reference NEI 00-01, Section 3.2.1.2)
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OE003, OE005, OP017, PH333]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 112C - VCT OUTLET AOV {R0056(LC), R0063(LC), R0060(LCI), R0061(LI), R0062(LI)}

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

CVC - 313 - SEAL OR EXCESS LETDOWN RETURN ISOLATION MOV {C5057(L), C0873(LI), C0872(LOCI), C0871(P), E0061(P), E0061A(P), Cascading Impact}
CVC - 315A - INLET BLOCK VALVE TO SEAL RETURN FILTER {Requires Operator Action, Component in FA}
CVC - 315C - SEAL RETURN FILTER BYPASS VLV {Requires Operator Action, Component in FA}
CVC - PCH01A - CHRG PUMP A {L0400C(L), L0399(LOCI), L0400(LOCI), E0063(P), E0064(P), E0307(P), L0398(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABBM-026

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**VFDR**

Fire damage to cabling and/or process sensing lines could cause the loss of both channels of MCB RWST level indication (LI-920 & LI-921). The RWST is the preferred Charging suction source for a fire in in this area.
This VFDR is associated with the Process Monitoring Function. [OP310]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

SIS - LI-920 - RWST LEVEL {LT-920-LINE(I), R0369(I)}
SIS - LI-921 - RWST LEVEL {LT-921-LINE(I), R3689(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-027

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**VFDR**

A MSO concern exists related to KDG01A spuriously start without cooling.
With offsite power available and KDG01A idle, 52/EG1A1 can spuriously close onto an energized BUS14 causing a reverse power relay trip signal to

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

52/EG1A1 (BUS14) and 52/EG1A2 (BUS18). Breaker 52/EG1A1 is subject to spurious closure due to fire damaged cabling (L0185 or L0319). The short bypasses all interlocks that prevent premature breaker closure.
A subsequent LOOP (resulting in loss of MAC power to BUS18 with 52/EG1A2 locked out due the reverse power relay trip signal) AND a DG start would result in KDG01A running without cooling.
This VFDR is associated with the Vital Auxiliaries Function. [OP314]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0185(LC), L0319(LOCI), E0063(P), E0064(P), L0318(P), Cascading Impact}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0318(P), Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0780(LC), L0782(LC)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-028

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**VFDR**

Loss of credited Train “A” CREATS is postulated due to the following separation concerns:
(a) Fire damage to cable (L0391) results in loss of power to MCCC, which in turn impacts credited Train “A” CREATS due to loss of power to MCCN - OR -
(b) Fire damage to cable (C5618) results in loss of power to MCCN, which in turn impacts credited Train “A” CREATS components
Since the redundant Train "B" components are also considered unavailable (deterministic assumption), a loss of the Safe Shutdown Support function for MCR habitability and MCR equipment operability is postulated.
This VFDR is associated with the Vital Auxiliaries Function. [OP317, OP318]
This condition represents a variance from the deterministic requirements of Section 4.2.3 of NFPA 805. This is a separation issue.

**Component(s)**

CBV - AKA05A - CREATS HEATER A {Cascading Impact}
CBV - AKF10A - CREATS TRAIN A FAN {Cascading Impact}

| | | |
|---|---|---|
| **Fire Area ID:** | ABBM - Auxiliary Building Basement/Mezzanine | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

CBV - AKP07A - CREATS COOLING SYSTEM TRAIN A {Cascading Impact}
LAC - ACPDPCB11 - CREATS LIGHTING PANEL A {Cascading Impact}
LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOC), E0061(P), E0061A(P), E0063(P), E0064(P), Cascading Impact}
LAC - MCCN - MOTOR CONTROL CENTER N {C5618(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-029

**VFDR**

A MSO concern exists related to inadvertent RCS pressure decrease. The scenario is postulated due to the following separation concerns:
(a) Failure of PZR Heaters (EHTRRC01A, EHTRRC02A, EHTRRC01B, and EHTRRC02B), - AND -
(b) Inability to trip and/or spurious start of at least one RCP (PRC01A and/or PRC01B) with spurious opening of PZR Spray valves (AOV-431A and AOV-431B), - AND -
(c) Inability to trip and/or spurious start of at least one CHG Pump (PCH01A, PCH01B, and/or PCH01C) with spurious opening of Auxiliary Spray valve (AOV-296)
Local actions are taken to mitigate spurious operation as follows:
(a) Open breakers at DC power panel. However, operator action to "de-power" circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit. - AND -
(b) Isolate IA to Containment causing the valves to fail closed. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented. - AND -
(c) Stop the RCPs - AND -
(d) Stop the CHG Pumps
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP017, OP319, PH302, PH303, PH334]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Requires Operator Action}

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

CVC - 296 - AUX SPRAY AOV {R0542(LOI)}
CVC - PCH01A - CHRG PUMP A {L0400C(L), L0399(LOCI), L0400(LOCI), E0063(P), E0064(P), E0307(P), L0398(P)}
CVC - PCH01B - CHRG PUMP B {L0264A(L), L0714(LC), L0263(LOCI), L0264(LOCI), E0168(P), E0169(P), L0262(P)}
CVC - PCH01C - CHRG PUMP C {L0268A(L), L0715(LO), L0267(LOCI), L0268(LOCI), E0168(P), E0169(P), L0266(P)}
IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}
RCS - 431A - PZR SPRAY VALVE (AOV) {R1091(LOC)}
RCS - 431B - PZR SPRAY VALVE (AOV) {R1096(LOC)}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), C2205(P), C2206(P), C2207(P), C2208(P), C2209(P), C2210(P), C2211(P), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P)}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {L0716(L), L0276(LOCI), C2223(P), C2224(P), C2225(P), C2226(P), C2227(P), C2228(P), C2229(P), E0168(P), E0169(P), L0271(P), L0271A(P), L0271B(P), L0272(P), L0272A(P)}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), C2212(P), C2213(P), C2214(P), C2215(P), C2216(P), C2217(P), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P)}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {L0716(L), L0276(LOCI), C2230(P), C2231(P), C2232(P), C2233(P), C2234(P), C2235(P), E0168(P), E0169(P), L0271(P), L0271A(P), L0272(P), L0272A(P), L0272B(P)}
RCS - PRC01A - RCP A {C1281(L), M0050(LC)}
RCS - PRC01B - RCP B {C1370(L), M0145(LC), M0140(P)}

**Disposition** This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-ABBM-030

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**VFDR** Credited TDAFW Pump suction cannot be aligned to SW from the MCB due to cable damage or a loss of AC power to Train “B” MOV-4013 and normally closed in-series valve 4098 (normal CST re-fill capability is not credited). In addition, suction line drain valve 4358D is normally open.
Local action is taken to align SW to the TDAFW Pump suction when CST level indicates less than 5 feet.
This VFDR is associated with the Decay Heat Removal Function. [OP017, PC302]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

AFW - 4098 - TDAFWP SUCTION FROM SWS MANUAL IV {Requires Operator Action}
AFW - 4358D - TDAFW PUMP SW SUCTION LINE TELLTALE ISOL VLV {Requires Operator Action}
LAC - MCCD - MOTOR CONTROL CENTER D {E0167(P), E0167A(P), E0168(P), E0169(P), L0287(P), L0288(P), L0289(LOC), Requires Operator Action, Component in FA}
SWS - 4013 - TDAFWP SW SUCTION MOV {C1214(P), C1216(LOCI), E0167A(P), E0167(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump, and AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the initial supply is depleted, were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

**VFDR ID** VFDR-ABBM-031

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**VFDR**

Fire damage to HEMYC wrapped cabling (C0687), which is no longer considered "qualified" as a 1-hour rated fire barrier, affects the 480V AC power to credited EDG1A support components. Consequently, ACPDPDG01, PDG02A, ADF01A, ADF01B, and LIT-2050A would be unavailable.
This VFDR is associated with the Vital Auxiliaries Function. (OE012, OP313)
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DBV - ADF01A - EDG A ROOM COOLING FAN {Cascading Impact}
DBV - ADF01B - EDG A ROOM COOLING FAN {Cascading Impact}
DGS - LIT-2050A - A D/G FUEL OIL DAY TANK (ALARM & CONTROL) {Cascading Impact}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
LAC - ACPDPDG01 - DIESEL GENERATOR A HEAT TRACE PANEL {Cascading Impact}
LAC - MCCH - MOTOR CONTROL CENTER H {C0687(P)}

| | | |
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| **Fire Area ID:** | ABBM - Auxiliary Building Basement/Mezzanine | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-032

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**VFDR**

Fire damage to HEMYC wrapped cabling (L0400 and L0398), which is no longer considered "qualified" as a 1-hour rated fire barrier, affects power to credited CHG Pump (PCH01A). Loss of DC power cable L0400 results in the loss of 125V control of PCH01A and loss of AC power cable L0398 results in the loss of 480V power to PCH01A.
This VFDR is associated with the Reactivity Control Function, and the Inventory and Pressure Control Functions. (OE012, OP315)
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - PCH01A - CHRG PUMP A {L0400C(L), L0399(LOCI), L0400(LOCI), E0063(P), E0064(P), E0307(P), L0398(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-033

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**VFDR**

Fire damage to HEMYC wrapped cabling (E0053), which is no longer considered "qualified" as a 1-hour rated fire barrier, affects power to credited DC power distribution panel DCPDPAB01A. Loss of cable E0053, results in the loss of control of multiple credited SSD components from the MCB.
This VFDR is associated with the Vital Auxiliaries Function. [OE012, OP312]
This condition represents a variance from the deterministic requirements of Section 4.2.3 of NFPA 805. This is a separation issue.

**Component(s)**

AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {Cascading Impact}
AFW - PSF01A - SAFW PUMP C {FWL0010(LI), L0744(LO), E0063(P), E0064(P), Cascading Impact}
BDC - DCPDPAB01A - AUX BLDG DC DIST PANEL A {E0053(P)}
BDC - DCPDPAB02A - AUX BLDG DC DIST PANEL A1 {E0053(P), Cascading Impact}

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

BDC - DCPDPAB03A - AUX BLDG DC DIST PANEL A2 {Cascading Impact}
CVC - PCH01A - CHRG PUMP A {L0400C(L), L0399(LOCI), L0400(LOCI), E0063(P), E0064(P), E0307(P), L0398(P), Cascading Impact}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0185(LC), L0319(LOCI), E0063(P), E0064(P), L0318(P), Cascading Impact}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0185(LC), L0315(LOCI), E0063(P), E0064(P), Cascading Impact}
LAC - 52/BT14-13 - BKR FOR BUS14 TO BUS13 TIE {E0063(P), E0064(P), L0328(P), L0329(LOCI), Cascading Impact}
LAC - BUS14 - 480V SWITCHGEAR {L0185(LC), L0776(LO), L0315(LOCI), L0319(LOCI), L0329(LOCI), E0063(P), E0064(P), L0318(P), L0328(P), Cascading Impact}
LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOC), E0061(P), E0061A(P), E0063(P), E0064(P), Cascading Impact}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), C2205(P), C2206(P), C2207(P), C2208(P), C2209(P), C2210(P), C2211(P), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P), Cascading Impact}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), C2212(P), C2213(P), C2214(P), C2215(P), C2216(P), C2217(P), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P), Cascading Impact}
SIS - 841 - ACCUM A TO LOOP B {C5558(L), C0846(LOCI), C0842(P), C0842A(P), C0842B(P), E0061(P), E0061A(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-035

**VFDR**

Infeed power supply breaker could spuriously open due to fire damage at cable L0391 such that MCCC cannot be energized from BUS14. This would result in a loss of all downstream power supplies fed from MCCC.
This VFDR is associated with the Vital Auxiliaries Function. [OP317]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

IAC - CVTA1 - INSTRUMENT BUS B CONSTANT VOLTAGE XFMR {C0640(P), Cascading Impact}
IAC - IBPDPCBB - INSTR POWER DISTRIBUTION PANEL B {Cascading Impact}
IAC - IBPDPCBBW - INSTRUMENT BUS B {C0640(P), Cascading Impact}
LAC - ACPDPAB14 - AUX BLDG POWER DISTRIBUTION PANEL AB-14 {Cascading Impact}
LAC - ACPDPCB11 - CREATS LIGHTING PANEL A {Cascading Impact}

**Fire Area ID:** ABBM - Auxiliary Building Basement/Mezzanine **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOC), E0061(P), E0061A(P), E0063(P), E0064(P), Cascading Impact}
LAC - MCCH - MOTOR CONTROL CENTER H {C0687(P), Cascading Impact}
LAC - MCCL - MOTOR CONTROL CENTER L {AFC0001(P), AHC0201(P), C5320(P), FWC0001(P), FWC0014(P), FWC0022(P), FWC0030(P), FWC0075(P), Cascading Impact}
LAC - MCCN - MOTOR CONTROL CENTER N {C5618(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABBM-038

**VFDR**

Fire damage to cabling affects credited KDG01A availability as follows:
(a) Both “A” (L0365 or L0780) and “B” (L0782) DG start circuits are impacted preventing automatic DG start, AND fire damage to common power cable (L0365) prevents the DG from being started locally at the DGAELCP.
(b) Loss of control of DG-A Fuel Oil Day Tank SOV(s) and DG-A Fuel Oil Transfer Pump are postulated due to an impacted common power supply cable (L0365) routed in this fire area. As a consequence, long-term fuel supply to KDG01A is not available challenging availability of the credited DG.
This VFDR is associated with the Vital Auxiliaries Function. [OP016, OP021]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DGS - 5907 - DG A FUEL OIL DAY TANK SOV {L0365(L)}
DGS - 5907A - FOTP A RECIRC SOV {L0365(L)}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0780(LC), L0782(LC)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Plant Modification ESR-12-0412, providing fusing to protect against consequences of a hot short on Cable L0365, was credited to help resolve this VFDR.

| | | |
|---|---|---|
| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **Fire Area Definition** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Fire Zone ID | Description |
|---|---|
| ABO | 271'-0", 278'-4" & 281'-10", AB Operating Floor |
| CPB | 269'-2", Canister Preparation Building |
| IB-0 | 237' and 238'-0", Intermediate Bldg Sub-Basement |
| IBN-1 | 253'-6" Intermediate Building North |
| IBN-2 | 278'-4" Intermediate Building North |
| IBN-3 | 298'-4" Intermediate Building North |
| IBN-4 | 293'-0" Intermediate Building North |
| IBS-1 | 253'-6" Intermediate Building South |
| IBS-2 | 271'-0" Intermediate Building South |
| IBS-3 | 293'-0" Intermediate Building South |
| N2 | 271'-0" Nitrogen Storage Building |

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled byTrain “B” CVCS success path from the RWST to the RCS. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 4. Decay Heat Removal | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “B”:<br>o TDAFW Pump success path from the SG “B” MSS and pump suction from the CST or SWS<br>o SAFW Pump “D” success path from the SWS or FPS | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 5. Process Monitoring Function | RCS Temperature:TI-409A-2 (RCS LOOP A HL INDICATION) Location: IBELIP, TI-409B-2 (RCS LOOP A CL INDICATION) Location: IBELIP, TI-410A-1 (RCS LOOP B HL INDICATION (0-700 F)) Location: MCB, and TI-410B-1 (RCS LOOP B CL INDICATION) Location: MCB<br>RCS Pressure:PI-420A (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB<br>Pressurizer Level:LI-428 (PRZR LEVEL CHANNEL 3) Location: MCB<br>Steam Generator Level:LI-460AA (S/G "A" LEVEL APPENDIX R [0-520" H2O (WR)) Location: IBELIP and LI-507 (S/G "B" LEVEL [0 - 520" H20 (WR)) Location: MCB<br>Steam Generator Pressure:PI-469A (S/G "A" PRESSURE) Location: IBELIP, and PI-478 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:N-32R (APPENDIX R SOURCE RANGE MONITOR) Location: IBELIP, AND NI-32B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022B (CDST "B" LEVEL) Location: MCB, and LI-920 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2015A (TDAFW PUMP DISCH FLOW) Location: IBELIP, FI-4085A (SAFW PUMP "D" <PSF01B> DISCH FLOW) Location: SAF, FI-4085B (SAFW PUMP "D", <PSF01B> DISCH FLOW) Location: MCB | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “B” of the BDC/IAC System from Battery “B” or the TSC Battery System.<br>• AC Power availability is maintained by train “B” Diesel-Generator and train “B” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train “B” SWS success path or alignment of alternate cooling from the FPS to the “B” Diesel. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
| --- | --- | --- |
| | • Except for a Control Room fire, train "B" CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
| --- | --- |
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

**Fire Suppression Activities Effect on Nuclear Safety Performance Criteria**

(ABO)

Scenario 1: Suppression Effects in ABO of a Fire Originating In ABO:

Suppression effects (activation of sprinkler systems S35 and S36 or manual firefighting) are not expected to extend beyond the area of fire origin. Activation of an automatic sprinkler system would only be expected to activate a small number of sprinklers.

Scenario 2: Suppression Effects in ABO of a Fire Originating Outside of ABO:

Since automatic wet-pipe sprinkler systems are not electrically activated, operation of a fire suppression system outside of ABO could not impact automatic sprinkler systems within ABO. Similarly, manual firefighting activities outside of ABO would not be expected to affect equipment/components located within ABO.

(IB-0)

Scenario 1: Suppression Effects in IB-0 of a Fire Originating In IB-0:

There are no fixed suppression systems in IB-0 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in IB-0 of a Fire Originating Outside of IB-0:

There are no suppression systems in IB-0 that could be impacted by operation of a fire suppression system or manual firefighting outside of IB-0.

(IBN-1)

Scenario 1: Suppression Effects in IBN-1 of a Fire Originating In IBN-1:

Activation of the Turbine Driven Auxiliary Feedwater Pump Area and Oil Transfer Pump Area deluge system, S14, preaction sprinkler system, S15, or manual firefighting activities are not expected to extend beyond the area of fire origin. Water spray from the deluge system is expected to be substantially contained within the diked area of the feedwater pump. Preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box. The activation of a preaction sprinkler system would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in IBN-1 of a Fire Originating Outside of IBN-1:

Turbine Driven Auxiliary Feedwater Pump Area and Oil Transfer Pump Area deluge system S14 is actuated by the associated electric manual pull box which could be vulnerable to a fire originating outside IBN-1 if the electrical circuits and/or control panel are routed or located in the area of fire origin (e.g., SSA in the Relay Room). However, water is expected to be substantially contained in the Turbine Driven Auxiliary Feedwater Pump Area and Intermediate Building drainage system.

Since preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box, operation of a fire suppression system outside of IBN-1 could not impact preaction fire suppression systems within IBN-1.

Similarly, manual firefighting activities outside of IBN-1 would not be expected to affect equipment/components located within IBN-1.

Curbing is installed around the TDAFW pump lube oil system. Check valves have been installed in the drain piping to prevent backflow.

(IBN-2)

Scenario 1: Suppression Effects in IBN-2 of a Fire Originating In IBN-2:

There are no suppression systems in IBN-2 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

| | | |
|---|---|---|
| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

Scenario 2: Suppression Effects in IBN-2 of a Fire Originating Outside of IBN-2:

There are no suppression systems in IBN-2 that could be impacted by operation of a fire suppression system or manual firefighting activities outside of IBN-2.

(IBN-3)

Scenario 1: Suppression Effects in IBN-3 of a Fire Originating In IBN-3:

There are no suppression systems in IBN-3 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in IBN-3 of a Fire Originating Outside of IBN-3:

There are no suppression systems in IBN- hat could be impacted by operation of a fire suppression system or manual firefighting activities outside of IBN-3.

(IBN-4)

Scenario 1: Suppression Effects in IBN-4 of a Fire Originating In IBN-4:

There are no suppression systems in IBN-4 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in IBN-4 of a Fire Originating Outside of IBN-4:

There are no suppression systems in IBN-4 that could be impacted by operation of a fire suppression system or manual firefighting activities outside of IBN-4.

(IBS-1)

Scenario 1: Suppression Effects in IBS-1 of a Fire Originating In IBS-1:

There are no suppression systems in IBS-1 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in IBS-1 of a Fire Originating Outside of IBS-1:

There are no suppression systems in IBS-1 that could be impacted by operation of a fire suppression system or manual firefighting activities outside of IBS-1.

(IBS-2)

| | | |
|---|---|---|
| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

Scenario 1: Suppression Effects in IBS-2 of a Fire Originating In IBS-2:

There are no suppression systems in IBS-2 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in IBS-2 of a Fire Originating Outside of IBS-2:

There are no suppression systems in IBS-2 that could be impacted by operation of a fire suppression system or manual firefighting activities outside of IBS-2.

(IBS-3)

Scenario 1: Suppression Effects in IBS-3 of a Fire Originating In IBS-3:

There are no suppression systems in IBS-3 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in IBS-3 of a Fire Originating Outside of IBS-3:

There are no suppression systems in IBS-3 that could be impacted by operation of a fire suppression system or manual firefighting activities outside of IBS-3.

(N2)

Scenario 1: Suppression Effects in N2 of a Fire Originating In N2:

There are no suppression systems in N2 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in N2 of a Fire Originating Outside of N2:

There are no suppression systems in N2 that could be impacted by operation of a fire suppression system or manual firefighting activities outside of N2.

(CPB)

Scenario 1: Suppression Effects in CPB of a Fire Originating in CPB:

The activation of deluge fire suppression system S51 and manual firefighting activities are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in CPB of a Fire Originating Outside of CPB:

The suppression system and manual firefighting activities outside of CPB would not impact the suppression systems in the CPB, since the valve tamper switch, flow switch, and air compressor switch, are located in a Mechanical Room inside the CPB which is closed off by a door.

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R, S | Modifications: R S<br>Procedures/Recovery Actions: R |
| ABO | 271'-0", 278'-4" & 281'-10", AB Operating Floor | E, D | E, D | rr | Detection System, Z04: E D<br>Detection System, Z35: E D<br>Floor drains/sump: rr<br>Procedural Controls Regarding Flood Barriers: rr<br>Procedural Controls Regarding Securing Ventilation: rr<br>Water Suppression, S35: E D<br>Water Suppression, S36: E D |
| CPB | 269'-2", Canister Preparation Building | D | None | rr | Procedural Controls Regarding Securing Ventilation: rr<br>Trenches and floor drains: rr<br>Water Suppression, S51: D |
| IB-0 | 237' and 238'-0", Intermediate Bldg Sub-Basement | None | E, D | rr | Detection System, Z36: E D<br>Floor drains/sump: rr |
| IBN-1 | 253’-6” Intermediate Building North | E, D | E, R | E | Combustible Loading Controls: E<br>Detection System, Z22: E R<br>Physical separation greater than 20 ft.: E |

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| | | | | | Water Suppression, S14: E D<br>Water Suppression, S15: E D |
| IBN-2 | 278'-4" Intermediate Building North | None | E, D | E | Combustible Loading Controls: E<br>Detection System, Z37D1: E D<br>Physical separation greater than 20 ft.: E |
| IBN-3 | 298'-4" Intermediate Building North | None | E, D | E | Combustible Loading Controls: E<br>Detection System, Z37D2: E D<br>Physical separation greater than 20 ft.: E |
| IBN-4 | 293'-0" Intermediate Building North | None | E, D | E, rr | Combustible Loading Controls: E<br>Detection System, Z23: E D<br>Detection System, Z24: E D<br>Detection System, Z37D3: E D<br>Floor drains/sump: rr<br>Physical separation greater than 20 ft.: E<br>Procedural Controls Regarding Securing Ventilation: rr |
| IBS-1 | 253'-6" Intermediate Building South | None | E, D | rr | Detection System, Z38D1: E D<br>Floor drains/sump: rr |

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| | | | | | Procedural Controls Regarding Securing Ventilation: rr |
| IBS-2 | 271’-0” Intermediate Building South | None | E, D | rr | Detection System, Z38D2: E D<br>Floor drains/sump: rr<br>Procedural Controls Regarding Securing Ventilation: rr |
| IBS-3 | 293’-0” Intermediate Building South | None | E, D | rr | Detection System, Z38D3: E D<br>Floor drains/sump: rr<br>Procedural Controls Regarding Securing Ventilation: rr |
| N2 | 271’-0” Nitrogen Storage Building | None | None | None | None |

**Title** Fire Risk Evaluation for Fire Area ABI

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-05/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 7.02E-07

**Δ LERF** Units: [1] 3.05E-09

| | | |
|---|---|---|
| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **Fire Risk Evaluation** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**DID Maintained**

A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The installed fire detection system and suppression system are credited in the Fire PRA for Fire Zone IBN-1. Installed detection is also credited in Fire Zones ABO and IBS-1 to support manual suppression. Given the relatively high fire frequency in the fire area, the other fire detection systems installed in the fire area are credited for DID (none exists in Fire Zones CPB and N2). The installed fire suppression systems are also credited in Fire Zones ABO and CPB for DID. Portable extinguishers and hose stations are credited by the Fire PRA in Fire Zones IBN-1, IBN-2, IBS-1, and also in Compartment ABO-C1 of Fire Zone ABO. In the rest of the fire area, they are available for fire brigade use and do not require additional DID enhancement. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID** VFDR-ABI-001

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.
Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 112B, 112C, PCH01B, 9710A, 9710B). However, this action may not be successful due to the integrity of instrument air piping.
This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH003]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue and a separation issue.

**Component(s)**

AFW - 9710A - SAFW PUMP C RECIRC TO CONDENSATE TEST TANK {FWC0078(LI), FWC0076(LO), FWC0075(P), Cascading Impact}
AFW - 9710B - SAFW PUMP D RECIRC TO CONDENSATE TEST TANK {Cascading Impact}
CVC - 112B - RWST TO CHARGING PUMP SUCTION {Cascading Impact}
CVC - 112C - VCT OUTLET AOV {Cascading Impact}
CVC - PCH01B - CHRG PUMP B {E0169(P), Cascading Impact}
LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {E0169(P), Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-ABI-002

| | | |
|---|---|---|
| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR**

A loss of charging capability is possible. The VCT can fill with high temperature water from RCP seal leakoff, via the Seal Water HX without CCW cooling, flashing to steam in the VCT and causing VCT pressure to rise above head pressure of the RWST. When the CHG Pump is restarted, this can result in the pump drawing suction from the VCT (instead of the RWST), introducing saturated water and thereby damaging the CHG pump. This scenario is postulated due to the following separation concerns:
(a) Total loss of RCP seal cooling (Thermal Barrier AND Seal Injection) due to a LOOP (deterministic assumption) and loss of EAC power (credited KDG01B fails to start, while non-credited KDG01A is deterministically assumed to be unavailable), - AND -
(b) VCT isolation valve (AOV-112C) fails open on a loss of air (deterministic assumption) or 125V DC power - AND -
(c) RCP seal leak-off isolation valve (MOV-313) cannot be closed from the MCB due to a loss of power or spuriously reopens due to fire damaged cable (note, RCP Seal Outlet AOVs 270A and 270B should be maintained open for RCP #2 seal integrity).
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OE003, OP017]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 112C - VCT OUTLET AOV {Cascading Impact}
CVC - 313 - SEAL OR EXCESS LETDOWN RETURN ISOLATION MOV {C5057(L), C0872(LOCI), C0871(P), E0061(P), E0061A(P)}
CVC - PCH01B - CHRG PUMP B {E0169(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABI-004

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**VFDR**

A MSO concern exists related to inadvertent RCS pressure increase. This scenario is postulated due to the following separation concerns:
(a) Spurious operation of PZR Heaters (EHTRRC01A, EHTRRC02A, EHTRRC01B, and EHTRRC02B) due to fire damaged cabling, -AND-
(b) Loss of RCPs and normal pressurizer spray capability via 431A and 431B due to a LOOP (deterministic assumption), -AND-
(c) Inadvertent closure of AOV-296 due to an unrelated operator action to electrically fail AOV-270A closed by de-energizing circuit #6 at DCPDPCB04A
The resultant RCS pressure increase would cause PORVs and/or safety valves to open.
Local action is taken at BUS16 to de-energize pressurizer backup heaters (EHTRRC01B and EHTRRC02B).
This VFDR is associated with the Inventory and Pressure Control Functions. [OE009, PH805]

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A MAIN CONTROL BOARD DC DIST PANEL A {Cascading Impact}
CVC - 296 - AUX SPRAY AOV {Cascading Impact}
RCS - 431A - PZR SPRAY VALVE (AOV) {Cascading Impact}
RCS - 431B - PZR SPRAY VALVE (AOV) {Cascading Impact}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0737(LO), L0381(LOCI), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P)}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI), E0169(P)}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0737(LO), L0381(LOCI), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P)}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI), E0169(P)}
RCS - PRC01A - RCP A {C1281(L), M0050(LC), M0045(P), Cascading Impact}
RCS - PRC01B - RCP B {C1370(L), M0145(LC), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-005

**VFDR**

3-Phase proper phase rotation shorts must be considered for high/low pressure interface in-series valves MOVs 700 and 701 since power cabling for the valves is routed through this area. Reliance on de-powering to prevent spurious opening requires assurance that no three-phase cabling of the same or higher voltage is routed in the same raceway between the MCC and the valve. Spurious operation of these valves results in a high/low pressure system interface concern. Additionally; an IN 92-18 concern exists, as identified in DA-EE-2000-066 – Attachment G.
This VFDR is associated with the Inventory and Pressure Control Functions. [OP001, OP002, OP017]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

RHR - 700 - RHR PUMP SUCTION FROM RCS MOV {C0720(P), C0720A(P), C5019(P)}
RHR - 701 - RHR PUMP SUCTION FROM RCS {C1087(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the consideration that 3-phase proper polarity hot short are implausible. No recovery action was credited to resolve this VFDR.

**VFDR ID**

VFDR-ABI-006

**VFDR**

A MSO concern exists related to RWST drain down via Containment Spray Actuation. Actuation is possible due to the following separation concerns:
(a) High containment pressure signal from at least two out of three containment pressure transmitters (PT-946, PT-948 and/or PT-950) AND high containment pressure signal from at least two out of three containment pressure transmitters (PT-945, PT-947 and/or PT-949) - OR -
(b) Train "A" Pump (PSI02A) spurious starts and at least one discharge valve (860A) spuriously opens
This VFDR is associated with the Inventory and Pressure Control Functions. [OP003, OP017, OP816]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CSS - 860A - CS PUMP A DISCHARGE {C0755(LI), C0756(LOCI), C0754(P), E0061(P), E0061A(P), Cascading Impact}
CSS - 860B - CS PUMP A DISCHARGE {Cascading Impact}
CSS - 860C - CS PUMP B DISCHARGE {C0817(P), C0818(LI), C0819(LOCI), E0061(P), E0061A(P), Cascading Impact}
CSS - 860D - CS PUMP B DISCHARGE {Cascading Impact}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A {L0729(L), L0337(LOCI), E0063(P), E0064(P), L0336(P), Cascading Impact}
CSS - PSI02B - CONTAINMENT SPRAY PUMP B {Cascading Impact}
ESF - PT-945 - CNMT PRESS XMTR {R0895(I)}
ESF - PT-946 - CNMT PRESS XMTR {R0937(I)}
ESF - PT-947 - CNMT PRESS XMTR {R0984(I), PT-947-LINE}
ESF - PT-948 - CNMT PRESS XMTR {R0940(I), PT-948-LINE}
ESF - PT-949 - CNMT PRESSURE {R0987(I), PT-949-LINE}
ESF - PT-950 - PRESSURE TRANSMITTER CONTAINMENT PRESSURE INSTRUMENT LOOP 950 {R1030(I),PT-950-LINE}

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABI-007

**VFDR**

A MSO concern exists related to spurious (ESF) Safety Injection Actuation due to fire damaged cabling. Actuation is possible due to the following separation concerns:
(a) Low PZR pressure signal from two out of three PZR pressure transmitters (PT-430 and PT-431) - OR -
(b) Low PZR pressure signal (as above) AND either a low SG "B" pressure signal (from at least two out of three SG "B" pressure transmitter loops PI-478, PI-479 and/or PT-483) OR a low SG "A" pressure signal (from at least two out of three SG "A" pressure transmitter loops PT-468, PI-469 and/or PT-482) - OR -
(c) High containment pressure signal from at least two out of the three containment pressure transmitter loops (PT-945, PT-947, and/or PT-949) - OR -
(d) SI signal from Train "A" SI logic circuits (fire damage to cable L0772)
This VFDR is associated with the Inventory and Pressure Control Functions. [OP004, OP005, OP006]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

ESF - PT-945 - CNMT PRESS XMTR {R0895(I)}
ESF - PT-947 - CNMT PRESS XMTR {PT-947-LINE(I), R0984(I)}
ESF - PT-949 - CNMT PRESSURE {PT-949-LINE(I), R0987(I)}
ESF - SI-TRAIN-A - SAFEGUARDS INITIATION TRAIN A {L0354(), L0772()}
MSS - PI-469 - S/G A PRESSURE (MCB) {PT-469A-LINE(I), R0926(I), R3423(I), PT-469-LINE(L), Cascading Impact}
MSS - PI-478 - S/G B PRESSURE (MCB) {PT-478-LINE(I), R0975(I), Cascading Impact}
MSS - PI-479 - S/G B PRESSURE (MCB) {PT-479-LINE(I), R1024(I), R3419(I), Cascading Impact}
MSS - PT-468 - STM GEN A PRESS XMTR {PT-468-LINE(I), R0886(I), R3421(I), Cascading Impact}
MSS - PT-482 - S/G A STM PRESS XMTR {PT-482-LINE(I), R0978(I), R1285(I), R3425(I), Cascading Impact}
MSS - PT-483 - S/G B STM PRESS XMTR {PT-483-LINE(I), R0931(I), R1337(I), R3416(I), Cascading Impact}
RPS - PT-430 - PRZR PRESS XMTR {Cascading Impact}
RPS - PT-431 - PRZR PRESS XMTR {R0998(I), Cascading Impact}

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-008

**VFDR**

A MSO concern exists related to Inadvertent PORV Actuation as follows:
I. PORV opening and spurious operation/failure of block valve
(a) PORV (430) spuriously opens--when required closed for HSD--due to fire damage to SOV cables (8616A and 8619A), - AND -
(b) Block valve (516) fails open or spuriously opens after being closed due to cable fire damage
II. PORV opening due to high pressure signal
(a) High PZR pressure signal from PT-431 and a high PZR signal from PT-449 actuates 431C via SOV-8620B, - OR -
(b) High PZR pressure signal from at least two out of the three transmitters (PT-450, PT-451 and/or PT-452) actuates BOTH 430 (via 8616A and 8619A) and 431C (via 8616B and 8620B)
Action is taken at the MCB to mitigate spurious operation of PORV-430 by opening the 125V DC breaker at the DCPDPCB04A power panel. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP007, OP009, OP017, OP823, PH801]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue

**Component(s)**

BDC - DCPDPCB04A MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
IAS - 8619A - N2 ARMING SOV FOR PORV 430 {SAC0211A(LO), SAC0211B(LO)}
IAS - 8619B - N2 ARMING SOV FOR PORV 431C {Cascading Impact}
IAS - 8620B - PORV 431C ACTUATION SOV {Cascading Impact}
NAS - 8616A - ACCUM TO SURGE TANK SOV FOR PORV 430 {SAC0213(LO)}
NAS - 8616B - ACCUM TO SURGE TANK SOV FOR PORV 431C {Cascading Impact}
RCS - 430 - PORV (AOV) {SAC0211A(LO), SAC0211B(LO)}
RCS - 431C - PORV (AOV) {Cascading Impact}
RCS - 516 - PORV BLOCK VALVE (MOV) FOR 430 {C0690(P), C0692(LI), C0694(LOCI), E0061(P)}
RPS - PT-431 - PRZR PRESS XMTR {R0998(I)}
RPS - PT-449 - PRZR PRESS XMTR {R1104(I)}

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| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

RPS - PT-450 - RC OVERPRESS PROTECTION XMTR {SAI0106(I)}
RPS - PT-451 - RC OVERPRESS PROTECTION {SAI0107(I)}
RPS - PT-452 - RC OVERPRESS PROTECTION {SAI0108(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. .

**VFDR ID**

VFDR-ABI-011

**VFDR**

A MSO concern exists related to Inadvertent Steam Dumping due to spurious operation of ARVs. Steam dumping resulting in RCS over-cooling, RCS shrinkage, and low pressurizer level is possible due to the following separation concerns:
(a) ARVs (3410 and 3411) spuriously open due to fire damage to cables or to the digital feedwater circuit (ADF-CTRL) - OR -
(b) ARV 3411 opens due to a spurious High-Pressure signal for SG “A” (PT-468) - OR -
(c) ARV 3410 opens due to a spurious High-Pressure signal for SG “B” (PT-478)
Actions are taken at the MCB to mitigate spurious operation by de-energizing circuits at the DCPDPCB04A and DCPDPCB04B power panels. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Decay Heat Removal Function, and the Inventory and Pressure Control Functions. [OE010, OP017, OP802, OP821, OP822, PH809, PH810]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
BDC - DCPDPCB04B MAIN CONTROL BOARD DC DIST PANEL B {Requires Operator Action}
FCS - ADF-CTRL - ADVANCED DIGITAL FEEDWATER CONTROL {I/P-468-LINE(), R1252(), R1254(), R1255(), R1279A(), R1285(), R1309(), R1310(), R1331A(), R1337(), R3051(), R3053(), R3055(), R3057(), R3059(), R3061(), R3063(), R3065(), R3067(), R3069(), R4343(), R4344(), R4346(), R4348(), R4350(), R4352(), R4354(), R4356(), R4388(), R4393()}
MSS - 3410 - SG-B ATMOS RELIEF {G0239(LI), G0239A(LOI)}
MSS - 3411 - SG-A ATMOS RELIEF {G0232(LI), G0232A(LOI)}

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|---|---|---|
| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

MSS - PI-478 - S/G "B" PRESSURE (MCB) {PT-478-LINE(I), R0975(I)}
MSS - PT-468 - STM GEN "A" PRESS XMTR {PT-468-LINE(I), R0886(I), R3421(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-012

**VFDR**

A separation concern exists related to Inadvertent Steam Dumping as follows:
(a) Cable fire damage can prevent one or both MSIVs from closing - AND -
(b) Loss of power from ACPDPCB03 can fail open MSS valves to moisture separator reheaters (3425, 3425A, 3426, 3426A, 3427, 3427A, 3428, and 3428A) -AND/OR-
(c)Loss of power to solenoid valves 20/AST and 5501S3 (as a result of de-energizing circuits at DCPDPCB04A and DCPDPCB04B to mitigate other spurious operations) disables the turbine trip function of these valves, preventing them from closing Turbine Inlet Valves 3544, 3545, 3462, 3463, 3464, and 3465).This VFDR is associated with the Decay Heat Removal Function. [OP803, OP813] This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and issue a separation issue.

**Component(s)**

LAC - ACPDPCB03 - CONTROL BUILDING 120/208V DISTRIBUTION PANEL B1 {Cascading Impact}
LAC - ACPDPTB07 - TURBINE BUILDING MISCELLANEOUS 120V DISTRIBUTION PANEL A {Cascading Impact}
LAC - ACPDPTB10 - TURBINE BUILDING MISCELLANEOUS 120V DISTRIBUTION PANEL B {Cascading Impact}
MSS - 3425 - MAIN STEAM CONTROL AOV TO MSR 1A {Cascading Impact}
MSS - 3425A - MOISTURE SEPARATOR REHEATER 1A MINI WARMUP AIR OPERATED VALV {Cascading Impact}
MSS - 3426 - MAIN STEAM CONTROL AOV TO MSR 1B {Cascading Impact}
MSS - 3426A - MSR 1B MINI WARM-UP AOV {Cascading Impact}
MSS - 3427 - MAIN STEAM CONTROL AOV TO MSR 2A {Cascading Impact}
MSS - 3427A - MSR 2A MINI WARMUP AOV {Cascading Impact}
MSS - 3428 - MAIN STEAM CONTROL AOV TO MSR 2B {Cascading Impact}
MSS - 3428A - MSR 2B MINI WARMUP AOV {Cascading Impact}
MSS - 3516 - MSIV B {G1180(L), G1182(L), G1199(L), G1181(LC), G1183(LC), G1198(LC), G1200(LC), G1197(LI), G1201(LI)}

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| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

MSS - 3517 - MSIV A {G1186(L), G1188(L), G1193(L), G1187(LC), G1189(LC), G1192(LC), G1194(LC), G1191(LI), G1195(LI)}
TGS - 20/AST - TURBINE AUTO STOP TRIP SOLENOID (20/AST) {G0057(LO)}
TGS - 3462 - HP TURB E/H GOV VLV {Cascading Impact}
TGS - 3463 - HP TURB E/H GOV VLV {Cascading Impact}
TGS - 3464 - HP TURB E/H GOV VLV {Cascading Impact}
TGS - 3465 - HP TURB E/H GOV VLV {Cascading Impact}
TGS - 3544 - HP TURBINE MAIN STEAM STOP VLV {Cascading Impact}
TGS - 3545 - HP TURBINE MAIN STEAM STOP VLV {Cascading Impact}
TGS - 5501S3 - TURBINE EMERGENCY TRIP SOLENOID VALVE (20/ET) {G0059(LO)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Modification ESR-12-0128, which ensures automatic MSIV closure, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABI-013

**VFDR**

A separation concern exists related to aligning SAFW Pump “D” for SG inventory control during HSD as follows:
(a) Fire damage to cables (FWC0026 and FWC0018) can result in SAFW cross-over MOV-9703A spuriously opening in conjunction with SAFW Pump “C” discharge MOV-9704A, partially diverting SAFW Pump “D” flow to SG "A". Additionally, re-positioning either of these valves via the hand wheel may not be successful due to IN 92-18 concerns as identified in DA-EE-2000-066 – Attachment G.
(b) Fire damage to cable (C0892 and C0898A) can result in spuriously closing SAFW supply valve from SW System MOV-4615. This causes a loss of suction source to SAFW Pump, PSF01B. Local action is taken to align SAFW Pump "D" (PSF01B) to SG "B”.
This VFDR is associated with the Decay Heat Removal Function. [OP001, OP017, OP804, OP809, PH807]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

AFW - 9703A - SAFW PUMP X-OVER MOV {FWC0025(LC), FWC0023(LI), FWC0026(LOI), FWC0022(P)}
AFW - 9704A - SAFW PUMP C MOV {FWC0017(LC), FWC0015(LI), FWC0018(LOI), FWC0014(P)}
AFW - PSF01B - SAFW PUMP D {E0169(P)}
SWS - 4615 - AUX BLDG MOV FROM SWP C/D {C0898A(LC), C0892(LOC), C0890(P), E0061(P), E0061A(P)}

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump, and AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the initial water supply is depleted, were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABI-014

**VFDR**

A MSO concern exists related to RCP (PRC01A) seal damage. Seal Outlet (AOV-270A) is susceptible to spurious closure (cable R0525). PRC01A can spuriously restart due to cable fire damage (M0050) bypassing the pump start permissive. If PRC01A continues to run with no seal cooling, pump damage would occur, leading to a pressure boundary breach.

Local action is taken to remove 125V DC power at DCPDPCB04A to fail AOV-270A open, and to mitigate subsequent spurious actuation. However, operator action to "de-power" circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.

This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP017, OP815, OP805, PH814]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}

CVC - 270A - RCP SEAL OUTLET AOV {R0525(LCI)}

RCS - PRC01A - RCP A {C1281(L), M0050(LC), M0045(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. Plant Modification ESR-11-0305, which provides the RCP pumps with shutdown seals, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABI-015

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR**

A MSO concern exists related to Excess Feedwater Flow to Steam Generators from the Aux Feedwater System. The scenario is possible due to the following separation concerns:
I. TDAFW pump (PAF03) providing excess flow to SGs
(a) Either steam supply MOV (3504A or 3505A) spuriously opens due to fire damaged cables -AND-
(b) Either DC Lube Oil Pump (PL011) or AC Lube Oil Pump (PLO10) spuriously starts due to fire damaged cables -AND-
(d) Discharge flow control MOV (3996) fails open (or spuriously opens when closed) due to fire damaged cables -AND-
(e) Discharge flow control AOVs (4297 and 4298) are administratively maintained open (valves can also fail open on deterministic assumption of loss of air).
- OR -
II. MDAFW Pumps (PAF01A and/or PAF01B) providing excess flow to SGs
(a) PAF01A and/or PAF01B spuriously starts due to fire damaged cables -AND-
(b) Discharge cross-over MOV (4000A) spuriously opens due to fire damaged cables -AND-
(c) Discharge MOV (4007 and/or 4008) fails open (or spuriously opens when closed) due to fire damaged cables.
Local action is taken to mitigate the spurious operation. However, any effort to control AFW flow locally would require entry into the fire area under consideration. The TDAFW pump, TDAFW pump steam supply valves, and TDAFW pump AC lube oil pump power supply are located in this fire area.
This VFDR is associated with the Decay Heat Removal Function. [OP017, OP806, PH803, PH806]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - 3996 - TDAFWP DISCHARGE MOV {E0093(L), E0094(L), E0095(L), E0096(LI), E0097(LOCI), E0338(LOCI), Located in FA}
AFW - 4000A - AFW CROSSOVER STOP VLV {AFC0001(P), AFC0002(LI), AFC0004(LCI), AFC0005(LOI), Located in FA}
AFW - 4007 - MDAFW PUMP A DISCHARGE MOV {C0707(P), C0708(LOCI), C0709(LIO), C0710(LO), C5059(L), E0061(P), E0061A(P), Located in FA}
AFW - 4008 - MDAFW PUMP B DISCHARGE MOV {C1073(P), C1075(LIO), Located in FA}
AFW - 4297 - TDAFWP FCV TO S/G A {G0902(LC), Located in FA}
AFW - 4298 - TDAFWP FCV TO S/G B {G0901(LC), Located in FA}
AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {L0374(L), L0735(LO), L0372(LOCI), L0373(LOCI), E0063(P), E0064(P), L0371(P), Located in FA}
AFW - PAF01B - AUXILIARY FEEDWATER PUMP B {L0373(LO), L0251(LOCI), L0252(LOCI), E0169(P), L0250(P), Located in FA}
AFW - PAF03 - TURBINE DRIVEN AUXILIARY FEEDWATER PUMP {Located in FA}
AFW - PLO10 - TDAFW PUMP AC LUBE OIL PUMP {C0591(LCI), C0590(P), E0061(P), E0061A(P), Located in FA}
AFW - PLO11 - TDAFWP DC LUBE OIL PUMP {E0194(LC), E0194A(LC), E0193(LCI), E0193A(LOC), E0191(P), E0192(P), E0340(P), Located in

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

FA}
BDC - DCPDPTB01B - TURBINE BLDG DC DISTRIBUTION PANEL {Cascading Impact, Requires Operator Action}
LAC - BUS14 - 480V SWITCHGEAR {L0185(LC), L0724(LO), L0727(LO), L0776(LO), L0315(LOCI), L0319(LOCI), L0329(LOCI), E0063(P), E0064(P), L0318(P), L0328(P), Cascading Impact, Located in FA}
LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOC), E0061(P), E0061A(P), E0063(P), E0064(P), L0389(P), L0390(P), Located in FA}
MSS - 3504A - SG B TO TDAFWP {E0109(L), E0110(L), E0111B(L), E0111(LI), E0111A(LI), E0112(LOCI), E0108(P), Located in FA}
MSS - 3505A - SG A TO TDAFWP {E0033(L), E0034(L), E0035(LI), E0036(LOCI), E0032(P), Located in FA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the long time needed for a steam generator to overfill from two motor-driven AFW pumps or the turbine-driven AFW pump spuriously running. This long time window ensures that the flow can be stopped before the overfill actually occurs. No recovery action was credited to resolve this VFDR.

**VFDR ID**

VFDR-ABI-016

**VFDR**

A SAFW flow diversion via the Condensate Test Tank Overflow is postulated as follows:
(a) With SAFW Pump "C" running, valve AOV-9710A can spuriously open due to cable fire damage OR can fail open upon loss of instrument air. AOV-9710A can also spuriously open due to cable fire damage to FI-4084A and FI-4084B.
(b) With SAFW Pump "D" running, valve AOV-9710B can fail open due to loss of instrument air.
This VFDR is associated with the Decay Heat Removal Function. [OP017, OP810]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

AFW - 9710A - SAFW PUMP C RECIRC TO CONDENSATE TEST TANK {FWC0078(LI), FWC0076(LO), FWC0075(P)}
AFW - 9710B - SAFW PUMP D RECIRC TO CONDENSATE TEST TANK {Cascading Impact}
AFW - FI-4084A - SAFW PUMP C DISCH FLOW - SAF {MER0018(I), MEC0003(P)}
AFW - FI-4084B - SAFW PUMP C DISCH FLOW - MCB {MER0018(I), MEC0003(P)}
AFW - PSF01A - SAFW PUMP C {FWL0009(L), FWL0010(LI), FWL0008A(LO), L0743(LO), L0744(LO), FWL0008(LOC), E0063(P), E0064(P),

FWL0001(P)}
AFW - PSF01B - SAFW PUMP D {Cascading Impact}

**Disposition**

Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, eliminates the Standby AFW connection to the Condensate test tank so that the tank can be used as the suction supply to the new Charging pump. As such, this plant modification also provides a deterministic resolution to this VFDR.

**VFDR ID**

VFDR-ABI-017

**VFDR**

A MSO concern exists related to Excess Feedwater Flow to SG “A” from the SAFW System as follows:
(a) Valve 9629A can spuriously open due to cable fire damage, - AND -
(b) SAFW Pump “C” (PSF01A) can spuriously start due to cable fire damage, - AND -
(c) Cable fire damage prevents closing valve 9701A and 9704A.
This results in SAFW Pump C (PSF01A) overfilling SG "A" adversely affecting RCS cool down rate.
This VFDR is associated with the Decay Heat Removal Function. [OP811]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

AFW - 9629A - SAFW PUMP C SUCTION MOV {FWC0033(LC), FWC0031(LI), FWC0034(LOI), FWC0030(P)}
AFW - 9701A - SAFW PUMP C DISCH MOV {FWC0002(L), FWC0008(L), FWC0006(LC), FWC0007(LI), FWC0004(LOC), FWC0005(LOC), FWC0001(P)}
AFW - 9704A - SAFW PUMP C MOV {FWC0017(LC), FWC0015(LI), FWC0018(LOI), FWC0014(P)}
AFW - PSF01A - SAFW PUMP C {FWL0009(L), FWL0010(LI), FWL0008A(LO), L0743(LO), L0744(LO), FWL0008(LOC), E0063(P), E0064(P), FWL0001(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the long time needed for a steam generator to overfill from a Standby AFW pump spuriously running. This long time window ensures that the flow can be stopped before the overfill actually occurs. No recovery action was credited to resolve this VFDR.

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| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| | |
|---|---|
| **VFDR ID** | VFDR-ABI-019 |
| **VFDR** | A separation concern exists due to fire damaged cables impacting both credited channels of SG "B" Pressure Indication (PI-478 and PI-479 at the MCB) and both credited channels of SG "A" Pressure Indication (PI-469 at the MCB and PI-469A at the IBELIP). Additionally, PI-478 cables are protected by HEMYC wrap which is no longer considered "qualified" as a 1-hour rated fire barrier.<br>This VFDR is associated with the Process Monitoring Function. [OE012, OP818, OP820]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | MSS - PI-469 - S/G A PRESSURE (MCB) {PT-469A-LINE(I), R0926(I), R3423(I), PT-469-LINE(L)}<br>MSS - PI-469A - S/G A PRESSURE (IBELIP) {PT-469A-LINE(I), R4084(I), E0301(P)}<br>MSS - PI-478 - S/G B PRESSURE (MCB) {PT-478-LINE(I), R0975(I)}<br>MSS - PI-479 - S/G B PRESSURE (MCB) {PT-479-LINE(I), R1024(I), R3419(I)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-ABI-020 |
| **VFDR** | Breaker 52/BT16-14 can spuriously close due to cable fire damage locking out any power supply breaker to BUS14 and BUS16 that is not closed at the time 52/BT16-14 closes. This prevents the buses from being powered by KDG01B adversely affecting the ability to achieve safe and stable conditions.<br>This VFDR is associated with the Vial Auxiliaries Function. [OP819]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | LAC - 52/BT16-14 - BREAKER FOR BUS 16 TO BUS 14 TIE {L0206(LC), L0203(LOC)}<br>LAC - BUS16 - 480V SWITCHGEAR {L0206(LC), L0203(LOC), E0169(P)} |

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-022

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**VFDR**

Fire damage to cables could cause spurious operation and loss of control from the MCB for multiple credited components powered from BUS16. No dedicated procedure action is taken to mitigate any spurious operations postulated due to this separation concern.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP826]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

AFW - PAF01B - AUXILIARY FEEDWATER PUMP B {L0373(LO), L0251(LOCI), L0252(LOCI), L0250(P)}
LAC - 52/BT16-14 - BREAKER FOR BUS 16 TO BUS 14 TIE {L0206(LC), L0203(LOC)}
LAC - BUS16 - 480V SWITCHGEAR {L0206(LC), L0203(LOC), Cascading Impact}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI)}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI)}
RCV - ACF08B - CONTAINMENT RECIRCULATING FAN B {L0224(LOCI), L0225(LOCI), Cascading Impact}
RCV - ACF08C - CONTAINMENT RECIRCULATING FAN C {L0239(LOCI), L0240(LOCI), Cascading Impact}
SFP - PAC07B - SPENT FUEL POOL RECIRCULATING PUMP B {C5307(LC), C5306(LO), Cascading Impact}
SIS - PSI01C - SI PUMP C {L0211(LC), L0726(LO), L0210(LOCI), L0325(LOCI), E0063(P), E0064(P), L0324(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. Recovery Action CVHFDCHGTRIPFIRE, consisting of locally securing the charging pumps, is also credited. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

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|---|---|---|
| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-ABI-023

**VFDR**

Fire damage to cables (L0276 or L0277) can cause the Pressurizer Backup Heaters to remain constantly energized or to remain off. In either case, the heaters cannot be controlled automatically or manually from the MCB adversely impacting RCS pressure control and control of RCS sub-cooling.
This VFDR is associated with the Inventory and Pressure Control Functions. [OP017, OP807]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI), E0169(P)}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI), E0169(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. Recovery Action CVHFDCHGTRIPFIRE, consisting of locally securing the charging pumps, is also credited. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID** VFDR-ABI-027

**VFDR**

A MSO concern exists related to RWST Drain Down via Containment Sump MOV-850A which is subject to spurious opening. MOV-856 is required to be closed to mitigate RWST drain down to the sump during HSD. Fire damage to cable C0790 can spuriously open 856, bypassing the control power key switch (1/856-KS on MCB).
Local action is taken to open the 480V AC breaker at MCCC within the fire area under consideration to mitigate this spurious operation and locally close MOV-856 in Fire Area ABBM.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OP010, OP017, PH802]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOC), E0061(P), E0061A(P), E0063(P), E0064(P), L0389(P), L0390(P), Located in FA}

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

RHR - 850A - CNMT SUMP TO RHR PUMP MOV {C0703(LI), C0704(LOCI), C0702(P), E0061(P), E0061A(P)}
RHR - 856 - RWST TO RHR MOV {C0791(L), C0789(LI), C0790(LOCI), C0788(P), E0061(P), E0061A(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-028

**VFDR**

If offsite power is available or non-credited KDG01A starts and connects to BUS14, various loads may spuriously start challenging a controlled shutdown of the plant. A spurious KDG01A start could be initiated by fire damage to cable L0780 for "A" starting circuit or cable L0782 for "B" starting circuit -AND- a spurious closure of breaker 52/EG1A1 could be initiated by fire damage to cables L0185 or L0319.
Local action is taken to mitigate the spurious operation. However, these actions would require entry into the fire area under consideration.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP826, PH803, PH813]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - PCH01A - CHRG PUMP A {E0063(P), E0064(P), E0307(P), L0398(P), L0400(LOCI), L0400C(L), L0739(LC), Cascading Impact}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {E0063(P), E0064(P), L0185(LC), L0318(P), L0319(LOCI)}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0780(LC), L0782(LC)}
LAC - BUS14 - 480V SWITCHGEAR {L0185(LC), L0724(LO), L0727(LO), L0776(LO), L0315(LOCI), L0319(LOCI), L0329(LOCI), E0063(P), E0064(P), L0318(P), L0328(P), Cascading Impact, Located in FA}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0737(LO), L0381(LOCI), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P), Cascading Impact}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0737(LO), L0381(LOCI), E0063(P), E0064(P), L0382(P), L0383(P), L0383A(P), Cascading Impact}
RHR - PAC01A - RHR PUMP A {L0736(LO), L0378(LOCI), E0063(P), E0064(P), L0377(P), Cascading Impact}
SIS - PSI01A - SI PUMP A {L0728(LO), L0333(LOCI), E0063(P), E0064(P), L0332(P), Cascading Impact}

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. Recovery Action CVHFDCHGTRIPFIRE, consisting of locally securing the charging pumps, is also credited. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABI-029

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**VFDR**

If offsite power is available, cable fire damage can prevent tripping one or both RCPs (PRC01A and/or PRC01B) from the MCB. The pumps continuing to run will have an adverse impact on controlling RCS cool down rate.
Local action is taken at the 4KV buses to trip both pumps.
This VFDR is associated with the Decay Heat Removal Function. [OP017, PH804]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

RCS - PRC01A - RCP A {C1281(L), M0050(LC), M0045(P)}
RCS - PRC01B - RCP B {C1370(L), M0145(LC)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-030

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**VFDR**

Fire damage to cables can cause SG Blowdown and RCS Sampling valves to spuriously open or remain open.
Local action is taken to de-energize the Nuclear Sample Panel. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP017, PH815]

**Fire Area ID:** ABI - Auxiliary Building Operating Floor and Intermediate Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPTB01B - TURBINE BLDG DC DISTRIBUTION PANEL {Cascading Impact}
LAC - NSP - NUCLEAR SAMPLING PANEL {Component in FA}
PSS - 951 - PZR STEAM SAMPLE AOV {R3135(LOI), R3140(LOI)}
PSS - 953 - PZR WATER SAMPLE AOV {R3141(LOI), R3150(LOI)}
PSS - 955 - LOOP B HL SAMPLE {R3141(LOI), R3150(LOI)}
PSS 966A - PZR STEAM SAMPLE AOV {R3164(LOI), R3165(LO), R3166(LI), R3167(LI), R3171(LOI)}
PSS 966B - PZR LIQUID SAMPLE AOV {R3164(LOI), R3168(LO), R3169(LI), R3170(LI), R3171(LOI)}
PSS 966C - LOOP B HL SAMPLE {R3159(LOI), R3160(LO), R3161(LI), R3162(LI), R3163(LOI)}
SGB - 5737 - SGB B AOV {R3181(LI), R3182(LI), R3180(LO), R3194(LO), R3176(LOI), R3192(LOI)}
SGB - 5738 - SGB A AOV {R3178(LI), R3179(LI), R3177(LO), R3194(LO), R3176(LOI), R3192(LOI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-031

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**VFDR**

A MSO concern exists related to Reactor Trip capability. Fire damage cabling would result in Reactor Trip breaker “open” function being unavailable as follows:
(a) 52/RTA: A line-ground fault (to cable L0611 or E0224 or L0614) would result in the loss of Trip Coil capability AND a hot short (to cable L0610) would result in the loss of UV Trip Coil capability - AND -
(b) 52/RTB: A line-ground fault (to cable L0631 or E0233 or L0634) would result in the loss of Trip Coil capability AND a hot short (to cable L0630) would result in the loss of UV Trip Coil capability.
Simultaneous fire damage to cabling as described above would result in automatic and manual Reactor Trip breaker tripping capability being unavailable.
Local action is taken to trip at the ROD DRIVE MG SET switchgear and REACTOR TRIP BREAKER switchgear.
This VFDR is associated with the Reactivity Control Function. [OP017, OP825, PH001, PH002]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue and a separation

issue.

**Component(s)**

LAC – 52/13 - BKR FOR BUS13 SUPPLY {L0329(LC), Cascading Impact}
LAC – 52/15 - BKR FOR BUS15 SUPPLY {Cascading Impact}
LAC - BUS13 - 480V SWITCHGEAR {Requires Operator Action}
LAC - BUS15 - 480V SWITCHGEAR {E0169(P), Cascading Impact, Requires Operator Action}
RPS - 52/RTA - REACTOR TRIP BREAKER A {L0610(LO), L0611(LOC), L0614(P), E0224(P)}
RPS - 52/RTB - REACTOR TRIP BREAKER B {L0630(LO), L0631(LOC), L0634(L), E0233(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDSCRAM-LCL, consisting of locally tripping the reactor, was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-032

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**VFDR**

A MSO concern exists related to spurious opening of Reactor Head Vent Valves (590 and 592) due to fire damaged cables.
Local action is taken to remove 125V DC power at DCPDPCB04A to fail Reactor Head Vents closed, and to mitigate subsequent spurious actuation.
However, operator action to "de-power" circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP017, OP022, PH801]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
RCS - 590 - REACTOR HEAD VENT OUTER (SOV) TO 592 {SAC0215(L), SAC0211A(LOI)}
RCS - 592 - REACTOR HEAD VENT INNER (SOV) TO 590 {SAC0215(L), SAC0213(LOI)}

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| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No Recovery Action was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-ABI-034

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**VFDR**

A separation concern exists due to fire damaged cables impacting both channels of PRZR LEVEL indication at the MCB. Credited Pressurizer Level Channel 3 (LI-428) is considered unavailable due to fire damaged cabling -AND- Pressurizer Level Channel 1 (LI-426) is considered unavailable due to a loss of cascading power supply upon Battery “A” depletion.
This VFDR is associated with the Process Monitoring Function. [OP808]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

RCS - LI-426 - PRZR LEVEL (MCB) {Cascading Impact}
RCS - LI-428 - PRZR LEVEL CHANNEL 3 (MCB) {R1004(I), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. Plant Modification ESR-12-0125, which provides in the control room a pressurizer pressure indication free of fire damage, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABI-035

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**VFDR**

A separation concern exists due to fire damaged cables impacting both channels of RCS pressure indication at the MCB. Credited RCS Pressure Channel 3 (PI-420A) is considered unavailable due to fire damaged cabling -AND- RCS Pressure Channel 1 (PI-420-2) is considered unavailable due to a loss of cascading power supply upon Battery “A” depletion.
This VFDR is associated with the Process Monitoring Function. [OP812]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

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| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Component(s)**

RCS - PI-420-2 - RCS HL PRESSURE (0-3000 PSIG at MCB) {Cascading Impact}
RCS - PI-420A - RCS PRESSURE (0-3000 PSIG at MCB) {R0877(I), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Modification ESR-12-0125, which provides pressurizer pressure indication, an adequate substitute for the monitoring functions, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-ABI-036

**VFDR**

During a postulated fire in this area, power to MCCM can be lost due to lack of breaker coordination. None of the load feeder breakers from MCCM are coordinated with the upstream incoming breaker. This cascading impact affects aligning SAFW Pump "D" for SG inventory control.
Loss of MCCM results in loss of ACPDPAB15 and SAFW components (AFP02, 9629B, 9701B, 9703B, and 9632B) failing in the undesired position.
This VFDR is associated with the Decay Heat Removal Function. [OP014]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

ABV - AFP02 - SAFW PUMP ROOM COOLING UNIT B {Cascading Impact}
AFW - 9629B - SAFW PUMP D SUCTION MOV {Cascading Impact}
AFW - 9701B - SAFW PUMP D DISCH MOV {Cascading Impact}
AFW - 9703B - SAFW PUMP X-OVER MOV {Cascading Impact}
AFW - 9746 - SAFW PUMP D DISCH MOV {Cascading Impact}
LAC - ACPDPAB15 - AUX BLDG POWER DISTRIBUTION PANEL AB-15 {Cascading Impact}
LAC - MCCM - MOTOR CONTROL CENTER M {AFC0009(P), Cascading Impact}
SWS - 9632B - SAFW ROOM B COOLER FCV {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the initial water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump, were credited to help resolve this VFDR. In addition, Plant Modifications ESR-

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| **Fire Area ID:** | ABI - Auxiliary Building Operating Floor and Intermediate Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

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|---|---|---|
| **Fire Area ID:** | BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) | **Fire Area Definition** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Fire Zone ID | Description |
|---|---|
| AVT | 253'-6", Condensate Demineralizer Building |
| GAB | 271’-0” Ginna Admin Building |
| H2 | 253'-6", Hydrogen Storage Bdlg |
| SB-1 | 253’-6” Service Building Basement |
| SB-1HS | 253’-6” Service Building Hot Shop |
| SB-1WT | 253’-6” & 271’-0” Service Building Water Treatment Room |
| SB-2 | 271'-0", SB General Offices Area (excludes SB-1WT) |
| TB-1 | 253'-6", Turbine Building Basement |
| TB-1FP | 253’-6” Turbine Building Feedpump Room |
| TB-2 | 271’-0” Turbine Building Intermediate Floor |
| TB-3 | 289'-6", Turbine Building Operating Floor |
| TO | 253’-6” Turbine Building Turbine Oil Storage Building |
| TSC-1M | 271’-0”Technical Support Center (Mechanical Equipment Room and Administrative Computer) |
| TSC-1N | 271’-0” Technical Support Center |

| | | |
|---|---|---|
| **Fire Area ID:** | BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) | **Fire Area Definition** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Fire Zone ID | Description |
|---|---|
| TSC-1S | 271'-0" Technical Support Center (South of Corridor) and includes TSC D-G, Inverter & Battery Rooms |

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train “A” CVCS success path from the RWST to the RCS<br>o Train “A” SIS success path from the RWST to the RCS and the PORV associated with the “A” nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “A”:<br>o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | o SAFW Pump “C” success path from the SWS or FPS | |
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • AC Power availability is maintained by train “A” Diesel-Generator and train “A” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train ”A” SWS success path or alignment of alternate cooling from the FPS to the “A” Diesel.<br>• Except for a Control Room fire, train “A” CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

**Fire Suppression Activities Effect on Nuclear Safety Performance Criteria**

Scenario 1: Suppression Effects in AVT of a Fire Originating In AVT:

There are no suppression systems in AVT and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in AVT of a Fire Originating Outside of AVT:

There are no suppression systems in AVT that could be impacted by operation of a fire suppression system or manual firefighting activities outside of AVT.

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Scenario 1: Suppression Effects in H2 of a Fire Originating In H2:

There are no suppression systems in H2 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in H2 of a Fire Originating Outside of H2:

There are no suppression systems in H2 that could be impacted by operation of a fire suppression system or manual firefighting activities outside of H2.

Scenario 1: Suppression Effects in SB-1 of a Fire Originating In SB-1:

Suppression effects (activation of wet-pipe sprinkler system S19 or manual firefighting activities) are not expected to extend beyond the area of fire origin. Activation of an automatic sprinkler system would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in SB-1 of a Fire Originating Outside of SB-1:

Since automatic sprinkler systems are not electrically activated, operation of a fire suppression system outside of SB-1 could not impact the automatic sprinkler system within SB-1. Similarly, manual firefighting activities outside of SB-1 would not be expected to affect equipment/components located within SB-1.

Scenario 1: Suppression Effects in SB-1HS of a Fire Originating In SB-1HS:

Suppression effects (activation of wet-pipe sprinkler system S19 or manual firefighting activities) are not expected to extend beyond the area of fire origin. Activation of an automatic wet-pipe sprinkler system would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in SB-1HS of a Fire Originating Outside of SB-1HS:

Since automatic wet-pipe sprinkler systems are not electrically activated, operation of a fire suppression system outside of SB-1HS could not impact the automatic sprinkler system within SB-1HS. Similarly, manual firefighting activities outside of SB-1HS would not be expected to affect equipment/components located within SB-1HS.

Scenario 1: Suppression Effects in SB-1WT of a Fire Originating In SB-1WT:

Suppression effects (activation of wet-pipe sprinkler system S19 or manual firefighting activities) are not expected to extend beyond the area of fire origin. Activation of an automatic sprinkler system would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in SB-1WT of a Fire Originating Outside of SB-1WT:

Since automatic wet-pipe sprinkler systems are not electrically activated, operation of a fire suppression system outside of SB-1WT could not impact the automatic sprinkler system within SB-1WT. Similarly, manual firefighting activities outside of SB-1WT would not be expected to affect equipment/components located within SB-1WT.

Scenario 1: Suppression Effects in SB-2 of a Fire Originating In SB-2:

Suppression effects (activation of wet-pipe sprinkler system S19 or manual firefighting activities) are not expected to extend beyond the area of fire origin. Activation of an automatic sprinkler system would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in SB-2 of a Fire Originating Outside of SB-2:

Since automatic wet-pipe sprinkler systems are not electrically activated, operation of a fire suppression system outside of SB-2 could not impact the automatic sprinkler system within SB 2. Similarly, manual firefighting activities outside of SB-2 would not be expected to affect equipment/components located within SB-2.

Scenario 1: Suppression Effects in TB-1 of a Fire Originating In TB-1:

Suppression effects (activation of suppression systems and manual firefighting activities) are not expected to extend beyond the area of fire origin. Automatic wet-pipe sprinkler system actuation as a result of a fire in the area would only be expected to activate small number of sprinklers. Deluge systems in TB-1 are designed to spray specific equipment or floor areas of the Turbine Building.

Scenario 2: Suppression Effects in TB-1 of a Fire Originating Outside of TB-1:

Condenser Pit, Seal Oil Unit, and Lube Oil Reservoir Area deluge systems are actuated by the associated fire detection system or manual pull boxes in the basement area which could be vulnerable to a fire originating outside TB-1 if the detection circuits and/or control panel are routed or located outside the fire zone (e.g., SSA in the Relay Room). However, these systems are designed to spray specific equipment in the Turbine Building and suppression effects are not expected to extend beyond TB-1 and TB-2.

Since automatic wet-pipe sprinkler systems are not electrically activated, operation of a fire suppression system outside of TB-1 could not impact the automatic wet-pipe sprinkler systems within TB-1 that could have an impact on the nuclear safety performance criteria.

Similarly, manual firefighting activities outside of TB-1 would not be expected to affect equipment/components located within TB-1.

Installed dike area around the Turbine Lube Oil Reservoir and oil collection transfer pumps to this reservoir from the seal oil unit enclosure. A trench also surrounds the Hydrogen Seal Oil Unit and contains drains that control flammable liquid spills from impacting adjacent areas.

Scenario 1: Suppression Effects in TB-1FP of a Fire Originating In TB-1FP:

There are no suppression systems in TB-1FP and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in TB-1FP of a Fire Originating Outside of TB-1FP:

There are no suppression systems in TB-1FP that could be impacted by operation of a fire suppression system or manual firefighting activities outside of TB-1FP.

Scenario 1: Suppression Effects in TB-2 of a Fire Originating In TB-2:

| | | |
|---|---|---|
| **Fire Area ID:** | BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

Suppression effects (activation of suppression systems and manual firefighting activities) are not expected to extend beyond the area of fire origin. Automatic wet-pipe sprinkler system actuation as a result of a fire in the area would only be expected to activate small number of sprinklers. Deluge systems in TB-2 are designed to spray specific equipment or floor areas of the Turbine Building.

Scenario 2: Suppression Effects in TB-2 of a Fire Originating Outside of TB-2:

The Lube Oil Reservoir Area deluge system is actuated by the associated fire detection system or manual pull boxes in the basement area which could be vulnerable to a fire originating outside TB-2 if the detection circuits and/or control panel are routed or located outside the fire zone (e.g., SSA in the Relay Room). However, this system is designed to spray specific equipment in the Turbine Building and suppression effects are not expected to extend beyond TB-1 and TB-2.

Since automatic wet-pipe sprinkler systems are not electrically activated, operation of a fire suppression system outside of TB-2 could not impact the automatic wet-pipe sprinkler systems within TB-2 that could have an impact on the nuclear safety performance criteria.

Similarly, manual firefighting activities outside of TB-2 would not be expected to affect equipment/components located within TB-2.

Scenario 1: Suppression Effects in TB-3 of a Fire Originating In TB-3:

Suppression effects (activation of suppression systems and manual firefighting activities) are not expected to extend beyond the area of fire origin. Deluge system S29 is designed to spray the North Wall of the Control Room in the Turbine Building.

The only potentially vulnerable components in the area associated with suppression systems protecting other Fire Zones that could be affected by water discharge from S29 is electric manual pull boxes S20, S21, S22, and S23 at the South Wall. The extent of consequences expected would be shorting out the switch and discharge of water to the associated transformers.

Scenario 2: Suppression Effects in TB-3 of a Fire Originating Outside of TB-3:

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Automatic deluge system S29 is actuated by the associated fire detection system which could be vulnerable to a fire originating outside TB-3 if the detection circuits and/or control panel are routed or located outside the fire zone (e.g., SSA in the Relay Room).However, this system is designed to spray on the Turbine Building side of the North Wall of the Control Room and suppression effects are not expected to extend beyond TB-3, TB-2 and TB-1.

Similarly, manual firefighting activities outside of TB-3 would not be expected to affect equipment/components located within TB-3.

Scenario 1: Suppression Effects in TO of a Fire Originating In TO:

Suppression effects (activation of suppression systems and manual firefighting) are not expected to extend beyond the area of fire origin. Deluge system S16 in TO is designed to spray the Turbine Lube Oil Storage Tank and other combustible liquids in the Oil Storage Room.

Scenario 2: Suppression Effects in TO of a Fire Originating Outside of TO:

The Oil Storage Room deluge system is actuated by the associated fire detection system or manual pull boxes in the area which could be vulnerable to a fire originating outside TO if the detection circuits and/or control panel are routed or located outside the fire zone (e.g., SSA in the Relay Room). However, this system is designed to spray on the Turbine Lube Oil Storage Tank and other combustible liquids in the Oil Storage Room and suppression effects are not expected to extend beyond TO.

Similarly, manual firefighting activities outside of TO could potentially spray on, and short out an electric manual pull box that could activate the deluge system. However, the system is designed to spray on the Turbine Lube Oil Storage Tank and other combustible liquids in the Oil Storage Room and suppression effects are not expected to extend beyond TO.

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R, S | Modifications: R S<br>Procedures/Recovery Actions: R |
| AVT | 253'-6", Condensate Demineralizer Building | None | None | None | None |
| GAB | 271'-0" Ginna Admin Building | D | D | None | Detection System, Z45: D<br>Water Suppression, S40: D<br>Water Suppression, S40C: D |
| H2 | 253'-6", Hydrogen Storage Bdlg | None | None | None | None |
| SB-1 | 253'-6" Service Building Basement | D | None | rr | Floor drains: rr<br>Water Suppression, S39: D |
| SB-1HS | 253'-6" Service Building Hot Shop | E, D | None | rr | Floor drains: rr<br>Water Suppression, S19: E D |
| SB-1WT | 253'-6" & 271'-0" Service Building Water Treatment Room | E, D | None | rr | Floor drains: rr |

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| | | | | | Water Suppression, S19: E D |
| SB-2 | 271'-0", SB General Offices Area (excludes SB-1WT) | E, D | None | rr | Floor drains: rr<br>Water Suppression, S19: E D |
| TB-1 | 253'-6", Turbine Building Basement | E, D | E, R | None | Detection System, Heat Detectors for S27: R<br>Detection System, Z32: E R<br>Detection System, Z33: E R<br>Detection System, Z40: E R<br>Water Suppression, S24: E D<br>Water Suppression, S25: E D<br>Water Suppression, S26: E D<br>Water Suppression, S27: E D<br>Water Suppression, S45: E D |
| TB-1FP | 253’-6” Turbine Building Feedpump Room | None | E, R | None | Detection System, Z32: E R |
| TB-2 | 271’-0” Turbine Building Intermediate Floor | E, D | E, R | None | Detection System, Heat Detectors for S27: R<br>Detection System, Z34: E R<br>Detection System, Z41: E R<br>Water Suppression, S26: E D<br>Water Suppression, S27: E D |

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| | | | | | Water Suppression, S38: E D |
| TB-3 | 289'-6", Turbine Building Operating Floor | D | E, D | None | Detection System, S29: E D<br>Water Suppression, S29: D |
| TO | 253'-6" Turbine Building Turbine Oil Storage Building | D | D | None | Detection System, S16: D<br>Water Suppression, S16: D |
| TSC-1M | 271'-0"Technical Support Center (Mechanical Equipment Room and Administrative Computer) | D | D | None | Detection System, Heat Detectors for S31: D<br>Detection System, S34D1: D<br>Detection System, S34D2: D<br>Detection System, Smoke Detectors for S33: D<br>Detection System, Z29: D<br>Water Suppression, S31: D<br>Water Suppression, S33: D |
| TSC-1N | 271'-0" Technical Support Center | D | D | None | Detection System, Smoke Detectors for S33: D<br>Detection System, Smoke Detectors for S37: D<br>Detection System, Z28: D<br>Detection System, Z31: D<br>Detection System, Z39: D<br>Water Suppression, S30: D |

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| | | | | | Water Suppression, S33: D<br>Water Suppression, S37: D |
| TSC-1S | 271'-0" Technical Support Center (South of Corridor) and includes TSC D-G, Inverter & Battery Rooms | D | D | None | Detection System, Z27: D<br>Detection System, Z30: D<br>Water Suppression, S30: D |

**Title** Fire Risk Evaluation for Fire Area BOP

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 2.66E-06

**Δ LERF** Units: [1] 2.35E-09

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The installed fire detection systems are credited in the Fire PRA for Fire Zones TB-1, TB-1FP, and TB-2 to support manual suppression. Given that the fire area has the highest fire frequency in the plant, the other fire detection systems installed in the fire area are credited for DID (none exists in Fire Zones AVT, H2, SB-1, SB-1HS, SB-1WT, and SB-2). Given a potential for structural fire scenarios in several fire zones, including TB-1 and TB-3, and the possibility of a hot gas layer formation in Fire Zone TB-2, the fire suppression systems installed in these fire zones are credited for DID. The installed fire suppression systems are also credited for DID in the other fire zones of the fire area (none exist in Fire Zones AVT, H2, and TB-1FP). Portable extinguishers and hose stations are credited by the Fire PRA in Fire Zones TB-1, TB-1FP, TB-2, and TB-3. In the rest of the fire area, they are available for fire brigade use and do not require additional DID enhancement. Existing administrative control are determined adequate given the nature of combustibles in the area and the

quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID** VFDR-BOP-001

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.

Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to maintain long term operation from the MCB of CHG Pump (PCH01A) AOV-112B, and AOV-112C. Components requiring manual action are located in this fire area and this action may not be successful due to the integrity of instrument air piping.

This VFDR is associated with the Vital Auxiliaries Function. [OE004, OE005, PC846]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {Loss of IA}
CVC - 112C - VCT OUTLET AOV {Loss of IA}
CVC - PCH01A - CHRG PUMP A: {Cascading Impact}
LAC - BUS13 - 480V SWITCHGEAR {L0177(LOCI), L0178(LOCI), COL0001(P), E0028(P), E0107(P), E0107A(P), L0130(P), L0328(P), Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {L0004(LOCI), L0005(LOCI), C5592(P), C5594(P), C5594A(P), C5804(P), C5805(P), E0028(P), E0029(P), E0107(P), L0024(P), L0047(P), L0079(P), L0197(P), Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action, Component in FA}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action, Component in FA}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action, Component in FA}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action, Component in FA}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-BOP-003

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR**

Loss of power to BUS14 and BUS18 is postulated with possible excessive loading on KDG01A due to the following separation concerns:
(a) Short to ground on cable L0316 can prevent opening of breaker 52/14. Breaker 52/14 is interlocked to 52/EG1A1 and prevents its closure and alignment of KDG01A to BUS14.
(b) Short to ground on cables L0505 or L0506 can prevent opening of breaker 52/18. Breaker 52/18 is interlocked to 52/EG1A2 and prevents its closure and alignment of KDG01A.
(c) Fire damage to cable L0499 can cause a loss of power to the control circuitry for breaker 52/MCC1G1 which would not trip open as required on a LOOP, thereby applying possible excessive loading on KDG01A.
Local action is required to control KDG01A, strip the loads off BUS14/BUS18, start KDG01A, close breaker 52/EG1A2, start SW Pumps and install selected 125V DC Control Power circuitry fuses (locally at BUS14 and BUS 18) to facilitate 480V AC breaker operation from the MCB.
This VFDR is associated with the Vital Auxiliaries Function. [OMC204, OMH201, OMH202, OMH203, OMH204, OMH205, OMH212, OP017, OP847, OP849, OP850]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

ABV - AAF04 - AUXILIARY BUILDING EXHAUST FAN G {Cascading Impact}
AFW - PAF01A - AUXILIARY FEEDWATER PUMP A: {Cascading Impact}
AFW - PSF01A - SAFW PUMP C: {Cascading Impact}
CCW - PAC02A - CCW PUMP A: {Cascading Impact}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A: {Cascading Impact}
CVC - PCH01A - CHRG PUMP A: {Cascading Impact}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14: {Cascading Impact}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), Cascading Impact}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14: {L0316(LOCI)}
LAC - 52/18 - SPT SUPPLY BREAKER TO BUS 18 {L0504(L), L0505(LOCI), L0506(LOCI)}
LAC - 52/BT14-13 - BKR FOR BUS14 TO BUS13 TIE : {L0177(LC), L0328(P)}
LAC - 52/IH1A - BREAKER FOR EHTRCW01A (CIRCULATING WATER INTAKE HEATER A) : {Cascading Impact}
LAC - 52/IH1C - BREAKER FOR EHTRCW01C (CIRCULATING WATER INTAKE HEATER C) : {Cascading Impact}
LAC - 52/MCC1G1 - MOTOR CONTROL CENTER G SUPPLY G1: {L0499(LOCI)}
LAC - BUS14 - 480V SWITCHGEAR: {L0177(LC), L0316(LOCI), M0095(LOCI), E0026(P), E0106(P), L0328(P), M0096(PI), Requires Operator Action}
LAC - BUS18 - 480V SWITCHGEAR: {L0429(LC), L0430(LC), L0504(LO), L0505(LOCI), L0506(LOCI), M0090(LOCI), E0026(P), E0106(P),

M0091(PI), Requires Operator Action}
LAC - MCCC - MOTOR CONTROL CENTER C: {Cascading Impact}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS: {Cascading Impact}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS: {Cascading Impact}
RCV - ACF08A - CONTAINMENT RECIRCULATING FAN A: {Cascading Impact}
RCV - ACF08D - CONTAINMENT RECIRCULATING FAN D: {Cascading Impact}
RHR - PAC01A - RHR PUMP A: {Cascading Impact}
SIS - PSI01A - SI PUMP A: {Cascading Impact}
SIS - PSI01C - SI PUMP C: {Cascading Impact}
SWS - PSW01A - SERVICE WATER PUMP A: {Cascading Impact}
SWS - PSW01C - SERVICE WATER PUMP C: {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0412, which provides fusing to prevent hot shorts on Diesel Generators, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-BOP-004

**VFDR**

A loss of the Service Air and Instrument Air Systems is postulated due to loss of BUS13 and BUS15 (both buses are located in this fire area) or fire damage to instrument air piping. This would result in AOV-112B and AOV-112C failing in an undesirable position, which would prevent proper alignment of the credited CHG pump flow-path from the MCB and would result in securing all CHG pumps until a CHG pump success path is locally established.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OMH211, OP846]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {Loss of IA}
CVC - 112C - VCT OUTLET AOV {Loss of IA}
CVC - 261 - VCT H2 INLT MANUAL BLK VLV {Requires Operator Action}

| | | |
|---|---|---|
| **Fire Area ID:** | BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

CVC - 289 - CHARGING PUMPS DISCHARGE ISOL VLV TO RCP SEAL INJECTION {Requires Operator Action}
CVC - 358 - RWST MAKEUP AOV BYPASS VALVE {Requires Operator Action}
CVC - PCH01A - CHRG PUMP A: {Cascading Impact}
LAC - BUS13 - 480V SWITCHGEAR {L0177(LOCI), L0178(LOCI), COL0001(P), E0028(P), E0107(P), E0107A(P), L0130(P), L0328(P), Cascading Impact, Component in FA}
LAC - BUS15 - 480V SWITCHGEAR {L0004(LOCI), L0005(LOCI), C5592(P), C5594(P), C5594A(P), C5804(P), C5805(P), E0028(P), E0029(P), E0107(P), L0024(P), L0047(P), L0079(P), L0197(P), Cascading Impact, Component in FA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-BOP-008

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**VFDR**

If offsite power is available, both RCPs (cable M0047 for PRC01A and cable M0142 for PRC01B) are subject to spurious operation due to cable fire damage. The pumps continuing to run will have an adverse impact on controlling RCS cool down rate.
Local action is taken to secure incoming power to BUS11A and BUS11B.
This VFDR is associated with the Decay Heat Removal Function. [OP017, OP854, PH825, PH826]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

RCS - PRC01A - RCP A: {M0051(LO), M0047(LOCI), E0025(P), E0027(P), M0045(P)}
RCS - PRC01B - RCP B: {M0051(L), M0142(LOCI), E0104(P), E0106A(P), M0140(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-BOP-012

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| | | |
|---|---|---|
| **Fire Area ID:** | BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR**

Loss of control of DG "A" Fuel Oil Day Tank SOV(s) and DG "A" Fuel Oil Transfer Pump are postulated due to impacted common power supply cable (L0365) routed in this fire area. As a consequence, long-term fuel supply to KDG01A is not available challenging availability of the credited DG.
This VFDR is associated with the Vital Auxiliaries Function. [OP016]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DGS - 5907 - DG A FUEL OIL DAY TANK SOV {L0365(L)}
DGS - 5907A - FOTP A RECIRC SOV {L0365(L)}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), Cascading Impact}

**Disposition**

Modification ESR-12-0412, which protects Cable L0365 from fire damages, is credited to deterministically resolve this VFDR.

**VFDR ID**

VFDR-BOP-013

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**VFDR**

Excessive load to KDG01A is postulated on a LOOP with KDG01A in-service. Cable damage (L0177) can spuriously close breaker 52/BT14-13 aligning KDG01A to BUS11A via BUS13. Cable damage (L0499) can cause a loss of power to control circuitry for breaker 52/MCC1G1. If MCCG is aligned to BUS18, breaker 52/MCC1G1 will not trip open as required on a LOOP.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP848, OP850]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), Cascading Impact}
LAC - 52/BT14-13 - BKR FOR BUS14 TO BUS13 TIE : {L0177(LC), L0328(P)}
LAC - 52/MCC1G1 - MOTOR CONTROL CENTER G SUPPLY G1: {L0499(LOCI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consist of aligning the TSC diesel generator and the TSC battery charger.

**Fire Area ID:** BOP - Balance of Plant (Bldgs CD, TSC, H2, Srv, TB, TO) **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0412, which provides fusing to prevent hot shorts on Diesel Generators, was credited to help resolve this VFDR.

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| BR1A | 253'-6", Control Building Complex Battery Room 1A |

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled byTrain “B” CVCS success path from the RWST to the RCS. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “B”:<br>o TDAFW Pump success path from the SG “B” MSS and pump suction from the CST or SWS<br>o SAFW Pump “D” success path from the SWS or FPS | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 5. Process Monitoring Function | RCS Temperature:TI-409A-2 (RCS LOOP A HL INDICATION) Location: IBELIP, TI-409B-2 (RCS LOOP A CL INDICATION) Location: IBELIP, TI-410A-1 (RCS LOOP B HL INDICATION (0-700 F)) Location: MCB, and TI-410B-1 (RCS LOOP B CL INDICATION) Location: MCB<br>RCS Pressure:PI-420A (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB<br>Pressurizer Level:LI-428 (PRZR LEVEL CHANNEL 3) Location: MCB<br>Steam Generator Level:LI-460AA (S/G "A" LEVEL APPENDIX R [0-520" H2O (WR)) Location: IBELIP and LI-507 (S/G "B" LEVEL [0 - 520" H20 (WR)) Location: MCB<br>Steam Generator Pressure:PI-469A (S/G "A" PRESSURE) Location: IBELIP, and PI-478 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:N-32R (APPENDIX R SOURCE RANGE MONITOR) Location: IBELIP, AND NI-32B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022B (CDST "B" LEVEL) Location: MCB, and LI-920 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2015A (TDAFW PUMP DISCH FLOW) Location: IBELIP, FI-4085A (SAFW PUMP "D", <PSF01B> DISCH FLOW) Location: SAF, FI-4085B (SAFW PUMP "D" <PSF01B> DISCH FLOW) Location: MCB | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “B” of the BDC/IAC System from Battery “B” or the TSC Battery System.<br>• AC Power availability is maintained by train “B” Diesel-Generator and train “B” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train “B” SWS success path or alignment of alternate cooling from the FPS to the “B” Diesel. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
| --- | --- | --- |
| | • Except for a Control Room fire, train "B" CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
| --- | --- |
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Scenario 1: Suppression Effects in BR1A of a Fire Originating In BR1A:

There are no suppression systems in BR1A and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in BR1A of a Fire Originating Outside of BR1A:

There are no suppression systems in BR1A that could be impacted by operation of a fire suppression system or manual firefighting activities outside of BR1A.

The floor drain is provided with backflow protection.

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R, S | Modifications: R S<br>Procedures/Recovery Actions: R |
| BR1A | 253'-6", Control Building Complex Battery Room 1A | None | E, R | E | Combustible Loading Controls: E<br>Detection System, Z42: E R |

**Title** Fire Risk Evaluation for Fire Area BR1A

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 5.09E-07

**Δ LERF** Units: [1] 3.94E-09

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The installed fire detection system in the fire area is credited in the Fire PRA to support manual suppression. There are no installed fire suppression systems in the fire area. Portable extinguishers and hose stations are available in adjacent fire areas, credited in the Fire PRA and do not require additional DID enhancement. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

| | | |
|---|---|---|
| **Fire Area ID:** | BR1A - Battery Room 1A, Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-BR1A-001

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.

Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 4297, 4298, 112B, 112C, PCH01B, 624, and 626). However, this action may not be successful due to the integrity of instrument air piping.

This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH415]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue.

**Component(s)**

AFW - 4297 - TDAFWP FCV TO S/G A {Loss of IA}
AFW - 4298 - TDAFWP FCV TO S/G B {Loss of IA}
CVC - 112B - RWST TO CHARGING PUMP SUCTION {Loss of IA}
CVC - 112C - VCT OUTLET AOV {Loss of IA}
CVC - PCH01B - CHRG PUMP B {Loss of IA}
LAC - BUS13 - 480V SWITCHGEAR {E0028(P), E0107(P), L0328(P), Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR { E0028(P), E0107(P), L0079(P), L0197(P), Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}
RHR - 624 - RHR HX B OUTLET {Loss of IA}
RHR - 626 - RHR HX BYPASS {Loss of IA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

| | | |
|---|---|---|
| **Fire Area ID:** | BR1A - Battery Room 1A, Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-BR1A-002

**VFDR**

A MSO concern exists related to spurious (ESF) Safety Injection Actuation due to cascading loss of Train "A" DC power. Actuation is possible due to:
(a) Low PZR pressure signal with two out of three PZR pressure transmitters loops (PT-429 and PT-430) impacted - OR -
(b) Low PZR pressure signal (as above) AND either a low SG "B" pressure signal (from two out of three SG "B" pressure transmitter loops PI-479 and PT-483) OR a low SG "A" pressure signal (from two out of three SG "A" pressure transmitter loops PT-468 and PI-469).
Local action is taken to de-energize SI actuation circuits by opening breakers at the DC power panels.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP005, OP006, OP015, OP017, PH419]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Cascading Impact, Requires Operator Action}
ESF - SI-TRAIN-A - SAFEGUARDS INITIATION TRAIN A {E0214 (P), Cascading Impact}
ESF - SI-TRAIN-B - SAFEGUARDS INITIATION TRAIN B {Cascading Impact}
MSS - PI-469 - S/G A PRESS (MCB) {R4373 (I) and Cascading Impact}
MSS - PI-479 - S/G B PRESS (MCB) {Cascading Impact}
MSS - PT-468 - STM GEN A PRESS XMTR {Cascading Impact}
MSS - PT-482 - S/G A STM PRESS XMTR {R4375 (I), Cascading Impact}
MSS - PT-483 - S/G B STM PRESS XMTR {R4389 (I), Cascading Impact}
RPS - PT-429 - PRZR PRESS XMTR {Cascading Impact}
RPS - PT-430 - PRZR PRESS XMTR {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-BR1A-003

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR**

A MSO concern exists related to inadvertent steam dumping. Failure of 125V DC cables E0215 and E0212 results in the inability to successfully TRIP the Turbine-Generator -AND/OR- ESTABLISH MS Isolation to the secondary plant from the MCB. Additionally, Condenser Steam Dump Valves are susceptible to spurious OPEN -AND- MSS supply valves to the MSRs could fail OPEN, which would severely exacerbate the RCS cool down due to Inadvertent Steam Dumping.

Local action is taken to fail closed MSIV B (AOV-3516) and MSIV A (AOV-3517).

This VFDR is associated with the Decay Heat Removal Function. [OP017, OP401, PH407, PH420]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

MSS - 3349 - STEAM GEN CONDENSER STEAM DUMP VLV {G0765(LO), G0780(LO), G0799(LO), Cascading Impact}
MSS - 3350 - STEAM GEN CONDENSER STEAM DUMP VLV {G0819(LO), G0830(LO), Cascading Impact}
MSS - 3351 - STEAM GEN CONDENSER STEAM DUMP VLV {G0765(LO), G0780(LO), G0799(LO), Cascading Impact}
MSS - 3352 - STEAM GEN CONDENSER STEAM DUMP VLV {G0819(LO), G0830(LO), Cascading Impact}
MSS - 3353 - STEAM GEN CONDENSER STEAM DUMP VLV {G0765(LO), G0780(LO), G0799(LO), Cascading Impact}
MSS - 3354 - STEAM GEN CONDENSER STEAM DUMP VLV {G0819(LO), G0830(LO), Cascading Impact}
MSS - 3355 - STEAM GEN CONDENSER STEAM DUMP VLV {G0765(LO), G0780(LO), G0799(LO), Cascading Impact}
MSS - 3356 - STEAM GEN CONDENSER STEAM DUMP VLV {G0819(LO), G0830(LO), Cascading Impact}
MSS - 3425 - MAIN STEAM CONTROL AOV TO MSR 1A {Cascading Impact}
MSS - 3425A - MOISTURE SEPARATOR REHEATER 1A MINI WARMUP AIR OPERATED VALV {Cascading Impact}
MSS - 3426 - MAIN STEAM CONTROL AOV TO MSR 1B {Cascading Impact}
MSS - 3426A - MSR 1B MINI WARM-UP AOV {Cascading Impact}
MSS - 3427 - MAIN STEAM CONTROL AOV TO MSR 2A {Cascading Impact}
MSS - 3427A - MSR 2A MINI WARMUP AOV {Cascading Impact}
MSS - 3428 - MAIN STEAM CONTROL AOV TO MSR 2B {Cascading Impact}
MSS - 3428A - MSR 2B MINI WARMUP AOV {Cascading Impact}
MSS - 3516 - MSIV B {G0714A(LC), E0212(P), E0215(P), Cascading Impact, Requires Operator Action}
MSS - 3517 - MSIV A {G0715(LC), E0212(P), E0215(P), Cascading Impact, Requires Operator Action }
MSS - STEAM-DUMP-CONTROL - STEAM DUMP CONTROLS {R1244(), Cascading Impact}
TGS - 20/AST - TURBINE AUTO STOP TRIP SOLENOID (20/AST) {E0215(P), Cascading Impact}
TGS - 3462 - HP TURB E/H GOV VLV {Cascading Impact}
TGS - 3463 - HP TURB E/H GOV VLV {Cascading Impact}
TGS - 3464 - HP TURB E/H GOV VLV {Cascading Impact}

| | | |
|---|---|---|
| **Fire Area ID:** | BR1A - Battery Room 1A, Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| | |
|---|---|
| | TGS - 3465 - HP TURB E/H GOV VLV {Cascading Impact}<br>TGS - 3544 - HP TURBINE MAIN STEAM STOP VLV {Cascading Impact}<br>TGS - 3545 - HP TURBINE MAIN STEAM STOP VLV {Cascading Impact}<br>TGS - 5501S3 - TURBINE EMERGENCY TRIP SOLENOID VALVE (20/ET) {E0212(P), Cascading Impact} |
| **Disposition** | Modification ESR-12-0128, which ensures automatic MSIV closure, deterministically resolves this VFDR. |
| **VFDR ID** | VFDR-BR1A-005 |
| **VFDR** | RCS cool down is challenged due to excess feed water flow to the SG. AFW Pump PAF01A can automatically start on a reactor trip. Fire damage to cable G1401 prevents control of AFW Pump PAF01A from the MCB.<br>This VFDR is associated with the Decay Heat Removal Function. [OP405]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {G1401(L), Cascading Impact} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the long time needed for a steam generator to overfill from an AFW pump spuriously running. This long time window ensures that the flow can be stopped before the overfill actually occurs. No recovery action was credited to resolve this VFDR. |
| **VFDR ID** | VFDR-BR1A-007 |
| **VFDR** | A loss of charging capability is possible. The VCT can fill with high temperature water from RCP seal leakoff, via the Seal Water HX without CCW cooling, flashing steam in the VCT and causing VCT pressure to rise above head pressure of the RWST. When the CHG Pump is restarted, this results in the pump drawing suction from the VCT (instead of the RWST), introducing saturated water and; thereby, damaging the credited CHG pump. This scenario is postulated due to the following separation concerns:<br>(a) Loss of CCW cooling, due to cable damage de-energizing credited SW Pumps (PSW01B and PSW01D), - AND - |

| | | |
|---|---|---|
| **Fire Area ID:** | BR1A - Battery Room 1A, Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

(b) VCT isolation valve (AOV-112C) fails open on a loss of instrument/service air OR loss of Train "A" DC power when Battery "A" is depleted, - AND -
(c) RCP seal leak-off isolation valve (MOV-313) fails open on loss of Train "A" AC power (note, RCP Seal Outlet AOVs 270A and 270B should be maintained open for RCP #2 seal integrity).
This VFDR is associated with the Reactivity Control Function, and Inventory Control and Pressure Control Functions. [OE003]
Impacted Components:
* CVC - 112C:  VCT OUTLET AOV {Cascading Impact}
* CVC - 313:  SEAL OR EXCESS LETDOWN RETURN ISOLATION MOV {Cascading Impact}
* CVC - PCH01B:  CHRG PUMP B {Cascading Impact}
* SWS - PSW01B: SERVICE WATER PUMP B {L0462(LOCI), Cascading Impact}
* SWS - PSW01D: SERVICE WATER PUMP D  {L0466(LOCI), Cascading Impact}
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3.  This is a separation issue.
Impacted Components:
* CVC - 112C:  VCT OUTLET AOV {Cascading Impact}
* CVC - 313:  SEAL OR EXCESS LETDOWN RETURN ISOLATION MOV {Cascading Impact}
* CVC - PCH01B:  CHRG PUMP B {Cascading Impact}
* SWS - PSW01B: SERVICE WATER PUMP B {L0462(LOCI), and Cascading Impact}
* SWS - PSW01D: SERVICE WATER PUMP D  {L0466(LOCI), and Cascading Impact}
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3.  This is a separation issue.

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-BR1A-009

**VFDR**

A MSO concern exists related to DG overload.  Prior to aligning KDG01B to the credited 480V Buses, isolating unnecessary loads is required to prevent DG overload.
This VFDR is associated with the Vital Auxiliaries Function. [OMH721]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3.  This is a separation issue.

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

LAC - 52/IH1B - BREAKER FOR EHTRCW01B (CIRCULATING WATER INTAKE HEATER B) {Cascading Impact}
LAC - 52/IH1D - BREAKER FOR EHTRCW01D (CIRCULATING WATER INTAKE HEATER D) {Cascading Impact}
LAC - BUS16 - 480V SWITCHGEAR {E0105(P), Cascading Impact}
LAC - BUS17 - 480V SWITCHGEAR {E0105(P), Cascading Impact}
RCV - ACF08B - CONTAINMENT RECIRCULATING FAN B {Cascading Impact}
RCV - ACF08C - CONTAINMENT RECIRCULATING FAN C {Cascading Impact}
SFP - PAC07B - SPENT FUEL POOL RECIRCULATING PUMP B {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-BR1A-018

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**VFDR**

Fire damage to cables (L0682, L0683, L0690, L0692 and L0877) can simulate an under-voltage condition that will load shed credited BUS16.
Local action is taken to disable circuitry at BUS16 under-voltage relay cabinet by removal of DC fuse blocks FUARB1RC 16/2-P and FUARB1RC 16/3-N.
This VFDR is associated with the Vital Auxiliaries Function. [PH402]
Impacted Component:
* LAC - UVBUS16: BUS 16 UV CIRCUITRY {L0682(), L0683(), L0690(), L0691(), L0692(), L0693(), L0877(), Cascading Impact}
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery

chargers. Either of these recover actions provides power for long-tern indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-BR1A-019

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**VFDR**

With offsite power available, cable fire damage prevents MCB trip of RCPs PRC01A (cable E0025) and PRC01B (cable E0104), and Feedwater Pumps PFW01A (cable E0025 or M0042) and PFW01B (cable E0104 or M0159). Additionally, cable fire damage could prevent closure of MFW isolation valves. This results in an impact to the ability to control SG inventory and RCS temperature.

Local action is taken at the switchgear to trip the pumps.

This VFDR is associated with the Decay Heat Removal Function. [OP403, PH409, PH412, PH413, PH414]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

MFW - 3976 - MFW PUMP B DISCHARGE MOV {E0021(P), Cascading Impact}
MFW - 3977 - MFW PUMP A DISCHARGE MOV {Cascading Impact}
MFW - 3994 - MAIN FW ISOLATION AOV TO S/G B {E0212(P)}
MFW - 3995 - MAIN FW ISOLATION AOV TO S/G A {E0215(P), Cascading Impact}
MFW - 4269 - MFW FCV TO S/G A {E0215(P), R0760(L), R0778(L), R0779(L), R0780(L), R0781(L), R0782(L), R0784(L), R0785(L), Cascading Impact}
MFW - 4270 - MFW FCV TO S/G B {E0212(P), R0769(L), R0778(L), R0780(L), R0781(L), R0782(L), R0784(L), R0785(L)}
MFW - 4271 - FCV 4269 BYPASS {E0215(P), R0760(L), R0778(L), R0779(L), R0780(L), R0781(L), R0782(L), R0784(L), R0785(L), Cascading Impact}
MFW - 4272 - FCV 4270 BYPASS {E0212(P), R0769(L), R0778(L), R0779(L), R0781(L), R0782(L), R0784(L), R0785(L)}
MFW - PFW01A - MFW PUMP A {M0042 (LC), E0025 (P), Cascading Impact}
MFW - PFW01B - MFW PUMP B {M0159 (LC), E0104 (P)}
RCS - PRC01A - RCP A {E0025 (P), Cascading Impact}
RCS - PRC01B - RCP B {E0104 (P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID** VFDR-BR1A-020

**VFDR**

On a loss of Instrument Air and Service Air due to a deterministic assumption of a loss of offsite power, AOV-112B (CHG Pump suction from RWST) can fail closed. A concurrent loss of Train "A" DC power when Battery "A" is depleted (or a loss of Instrument Air/Service Air) can fail open AOV-112C (CHG Pump suction from VCT). This can result in damage to the credited CHG Pump when VCT inventory is depleted.
Local action is taken to align the RWST to the CHG Pump suction header by opening manual valve V-358 (CHARGING PUMP SUCTION FROM RWST), closing manual valve V-261 (VCT HYDROGEN BLOCK VLV) and ensuring manual valve V-262 (VCT NITROGEN INLET VLV) is closed.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [PH411]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 261 - VCT H2 INLT MANUAL BLK VLV {Requires Operator Action}
CVC - 262 - VCT NITROGEN INLET MANUAL BLK VLV {Requires Operator Action}
CVC - 358 - CHARGING PUMP SUCTION FROM RWST MANUAL IV {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID** VFDR-BR1A-022

**VFDR**

Local alignment of BUS15 to BUS16 as a reliable power supply for MCCB (which supports availability of the 120V AC Instrument Bus D) is not viable since the power cable L0197 connecting BUS15 and BUS16 could be fire damaged in this area. Additionally, cross-tie breaker (52/BT16-15) is not coordinated with load breaker to MCCB from BUS15.
This VFDR is associated with the Vital Auxiliaries Function. [OP402, PH418]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

IAC - CVTA2 - INSTRUMENT BUS D CONSTANT VOLTAGE TRANSFORMER {C0500(P), Cascading Impact}
IAC - IBPDPCBD - INSTR POWER DISTRIBUTION PANEL D {Cascading Impact}
IAC - IBPDPCBDY - INSTRUMENT BUS D {C0500(P), Cascading Impact}
LAC - 52/15 - BKR FOR BUS 15 SUPPLY {E0028(P), E0107(P), Cascading Impact}
LAC - 52/BT16-15 - BREAKER FOR BUS 16 TO BUS 15 TIE {L0197(P), Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {E0028(P), E0107(P), L0079(P), L0197(P), Cascading Impact}
LAC - MCCB - MOTOR CONTROL CENTER B {E0021(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-BR1A-024

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**VFDR**

Loss of instrument buses (IBPDPCBAR and IBPDPCBBW) powered from Train “A” fails two out of three PZR level transmitter loops (LI-426 and LT-427) resulting in low-level signal that de-energizes the credited Train “B” PZR heaters. The signal cannot be bypassed by the selector switch on the MCB impacting the ability to control RCS pressure during cooldown.
This VFDR is associated with the Inventory and Pressure Control Functions. [OP019]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

BDC - DCPDPCB02A - BATTERY A MAIN FUSE CABINET{E0002(P), E0002A(P), E0248A(P), E0278A(P), E0278B(P), Cascading Impact}
BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A{E0014(P), Cascading Impact}
IAC - CVTA1 - INSTRUMENT BUS B CONSTANT VOLTAGE XFMR{C0640(P), Cascading Impact}
IAC - IBPDPCBA - INSTR POWER DISTRIBUTION PANEL "A"{Cascading Impact}
IAC - IBPDPCBAR - INSTRUMENT BUS "A"{C2500(p), Cascading Impact}
IAC - IBPDPCBB - INSTR POWER DISTRIBUTION PANEL "B"{Cascading Impact}
IAC - IBPDPCBBW - INSTRUMENT BUS "B"{C0640(p), C2503(p), Cascading Impact}
IAC - INVTCVTA - INSTRUMENT BUS A CONSTANT VOLTAGE INVERTER/TRANSFORMER{E0050(p), Cascading Impact}
LAC - BUS14 - 480V SWITCHGEAR {E0026(P), L0328(P) }

**Fire Area ID:** BR1A - Battery Room 1A, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

LAC - MCCC - MOTOR CONTROL CENTER C {Cascading Impact}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS{Cascading Impact}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS{Cascading Impact}
RCS - LI-426 - PRZR LEVEL (MCB){Cascading Impact}
RPS - LT-427 - PRZR LVL XMTR {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the consideration that pressurizer heaters are not required to prevent core damage in the Fire PRA. No recovery action was credited to resolve this VFDR.

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| BR1B | 253'-6", Control Building Complex Battery Room 1B |

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train “A” CVCS success path from the RWST to the RCS<br>o Train “A” SIS success path from the RWST to the RCS and the PORV associated with the “A” nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “A”:<br>o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | o SAFW Pump “C” success path from the SWS or FPS | |
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • AC Power availability is maintained by train “A” Diesel-Generator and train “A” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train ”A” SWS success path or alignment of alternate cooling from the FPS to the “A” Diesel.<br>• Except for a Control Room fire, train “A” CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Scenario 1: Suppression Effects in BR1B of a Fire Originating In BR1B:

There are no suppression systems in BR1B and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in BR1B of a Fire Originating Outside of BR1B:

There are no suppression systems in BR1B that could be impacted by operation of a fire suppression system or manual firefighting activities outside of BR1B.

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R | Modifications: R<br>Procedures/Recovery Actions: R |
| BR1B | 253'-6", Control Building Complex Battery Room 1B | None | E, R | E | Combustible Loading Controls: E<br>Detection System, Z43: E R<br>Fire-proofing material on structural steel: E |

**Title** Fire Risk Evaluation for Fire Area BR1B

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 1.10E-07

**Δ LERF** Units: [1] 7.04E-10

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The installed fire detection system in the fire area is credited in the Fire PRA to support manual suppression. There are no installed fire suppression systems in the fire area. Portable extinguishers and hose stations are available in adjacent fire areas, credited in the Fire PRA and do not require additional DID enhancement. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

| | | |
|---|---|---|
| **Fire Area ID:** | BR1B - Battery Room 1B, Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| | |
|---|---|
| **VFDR ID** | VFDR-BR1B-001 |
| **VFDR** | A MSO concern exists related to spurious (ESF) Safety Injection Actuation. Actuation is possible due to the following separation concerns:<br>(a) Low PZR pressure signal with two out of three PZR pressure transmitter loops (PT-430 and PT-431) impacted. PT-431 is impacted due to a loss of Train “B” DC power. PT-430 is unavailable prior to establishing EAC power to MCCC. - OR -<br>(b) Low PZR pressure signal (as above) AND either a low SG “A” pressure signal (from two out of three SG “B” pressure transmitter loops PI-478 and PT-483) OR a low SG “A” pressure signal (from two out of three SG “A” pressure transmitter loops PT-482 and PI-469). PI-478 and PT-482 are impacted due to a loss of Train “B” DC power. PT-483 and PI-469 are unavailable prior to establishing EAC power to MCCC.<br>This VFDR is associated with the Inventory and Pressure Control Functions. [OP005, OP006, OP017]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | MSS - PI-469 - S/G A PRESSURE (MCB) {Cascading Impact}<br>MSS - PI-478 - S/G B PRESSURE (MCB) {Cascading Impact}<br>MSS - PT-482 - S/G A STM PRESS XMTR {Cascading Impact}<br>MSS - PT-483 - S/G B STM PRESS XMTR {Cascading Impact}<br>RPS - PT-430 - PRZR PRESS XMTR {Cascading Impact}<br>RPS - PT-431 - PRZR PRESS XMTR {Cascading Impact} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-BR1B-003 |
| **VFDR** | On a postulated LOOP, fire damage to HEMYC wrapped cabling, which is no longer considered "qualified" as a 1-hour rated fire barrier, results in a loss of 480V AC power to credited Train “A” BUS14 and BUS18. Fire damage to cable L0318 (multiple phase to ground or a phase to phase fault) results in loss of BUS14 and BUS18 and thereby the capability to achieve safe and stable plant conditions.<br>This VFDR is associated with the Vital Auxiliaries Function. [OE012, OP507] |

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

ABV - AAP07 - CHARGING PUMP ROOM COOLING UNIT A {Cascading Impact}
ABV - AFP01 - SAFW PUMP ROOM COOLING UNIT A {Cascading Impact}
AFW - 9629A - SAFW PUMP C SUCTION MOV {Cascading Impact}
AFW - 9701A - SAFW PUMP C DISCH MOV {Cascading Impact}
AFW - 9703A - SAFW PUMP X-OVER MOV {Cascading Impact}
AFW - 9704A - SAFW PUMP C MOV {Cascading Impact}
AFW - FI-2031 - TDAFW PUMP DISCH FLOW (MCB) {Cascading Impact}
AFW - FI-4084A - SAFW PUMP C DISCH FLOW - SAF {Cascading Impact}
AFW - FI-4084B - SAFW PUMP C DISCH FLOW - MCB {Cascading Impact}
AFW - FT-2001 - MOTOR DRIVEN AUXILIARY FEED WATER PUMP A DISCHARGE FLOW TRAN {Cascading Impact}
AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {Cascading Impact}
AFW - PLO10 - TDAFW PUMP AC LUBE OIL PUMP {Cascading Impact}
AFW - PSF01A - SAFW PUMP C {Cascading Impact}
BDC - DCPDPAB01A - AUX BLDG DC DIST PANEL A {E0053(P) and Cascading Impact}
BDC - DCPDPAB02A - AUX BLDG DC DIST PANEL A1 {E0053(P) and Cascading Impact}
BDC - DCPDPAB03A - AUX BLDG DC DIST PANEL A2 {Cascading Impact}
BDC - DCPDPCB02A - BATTERY A MAIN FUSE CABINET {Cascading Impact}
BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Cascading Impact}
BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Cascading Impact}
BDC - DCPDPDG01A - EDG A DC DISTRIBUTION PANEL {E0020(P) and Cascading Impact}
BDC - DCPDPSH01A - SCREEN HOUSE DC DISTRIBUTION PANEL A {E0030(P) and Cascading Impact}
CBV - AKA05A - CREATS HEATER A {Cascading Impact}
CBV - AKD35A - CREATS TRAIN A DISCHARGE DAMPER {Cascading Impact}
CBV - AKF10A - CREATS TRAIN A FAN {Cascading Impact}
CBV - AKP07A - CREATS COOLING SYSTEM TRAIN A {Cascading Impact}
CCW - 738A - CCW TO RHR HX A MOV {Cascading Impact}
CCW - PAC02A - CCW PUMP A {Cascading Impact}
CND - LI-2022A - CDST A LEVEL {Cascading Impact}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A {Cascading Impact}

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

CVC - 112C - VCT OUTLET AOV {Cascading Impact}
CVC - PCH01A - CHRG PUMP A {Cascading Impact}
DBV - ADD01A - OUTLET DAMPER FOR ADF01A {Cascading Impact}
DBV - ADD01B - OUTLET DAMPER FOR ADF01B {Cascading Impact}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0320(LOC), L0318(P) and Cascading Impact}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0510(LOCI), L0318(P) and Cascading Impact}
IAC - ABELIP - AUX BLDG EMERG LOCAL INSTR PANEL {Cascading Impact}
IAC - CVTA1 - INSTRUMENT BUS B CONSTANT VOLTAGE XFMR {Cascading Impact}
IAC - FOX1 - FOXBORO INSTRUMENT RACK 1 {Cascading Impact}
IAC - IBPDPCBA - INSTR POWER DISTRIBUTION PANEL A {Cascading Impact}
IAC - IBPDPCBAR - INSTRUMENT BUS A {Cascading Impact}
IAC - IBPDPCBB - INSTR POWER DISTRIBUTION PANEL B {Cascading Impact}
IAC - IBPDPCBBW - INSTRUMENT BUS B {Cascading Impact}
IAC - IBPDPCBE - INSTR POWER DISTRIBUTION PANEL E {Cascading Impact}
IAC - INVTCVTA - INSTRUMENT BUS A CONSTANT VOLTAGE INVERTER/TRANSFORMER {Cascading Impact}
IAC - MQ483 - REACTOR PROTECTION INSTRUMENT RACK Y2 INVERTER {Cascading Impact}
IAC - RVLMS1 - REACTOR VESSEL LEVEL MONITOR RACK 1 {Cascading Impact}
IAC - SAFWPCIP - SAFW PUMP C INSTRUMENT PANEL {Cascading Impact}
IAS - 8619A - N2 ARMING SOV FOR PORV 430 {Cascading Impact}
LAC - ACPDPAB14 - AUX BLDG POWER DISTRIBUTION PANEL AB-14 {Cascading Impact}
LAC - ACPDPCB11 - CREATS LIGHTING PANEL A {Cascading Impact}
LAC - ACPDPDG01 - DIESEL GENERATOR A HEAT TRACE PANEL {Cascading Impact}
LAC - BUS14 - 480V SWITCHGEAR {L0472(LO), L0320(LOC), L0318(P) and Cascading Impact}
LAC - BUS18 - 480V SWITCHGEAR {L0472(LC), L0779(LO), L0469(LOCI), L0510(LOCI), L0318(P) and Cascading Impact}
LAC - BYCA1 - BATTERY CHARGER A1 {Cascading Impact}
LAC - MCCC - MOTOR CONTROL CENTER C {Cascading Impact}
LAC - MCCH - MOTOR CONTROL CENTER H {C0687(P), E0022(P) and Cascading Impact}
LAC - MCCL - MOTOR CONTROL CENTER L {Cascading Impact}
LAC - MCCN - MOTOR CONTROL CENTER N {Cascading Impact}
MFW - LI-461 - S/G A LEVEL (NR AT MCB) {Cascading Impact}
MFW - LI-504 - S/G A LEVEL (WR) (0-520 H2O)(MCB) {Cascading Impact}
MFW - LI-506A - S/G B WIDE RANGE LEVEL (IBELIP) {Cascading Impact}
MSS - PI-469 - S/G A PRESSURE (MCB) {Cascading Impact}

| | | |
|---|---|---|
| **Fire Area ID:** | BR1B - Battery Room 1B, Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

MSS - PI-479 - S/G B PRESSURE (MCB) {Cascading Impact}
RCS - LI-426 - PRZR LEVEL (MCB) {Cascading Impact}
RCS - LI-428A - PRZR LEVEL (ABELIP) {Cascading Impact}
RCS - LI-433A - PRZR LEVEL (MCB) {Cascading Impact}
RCS - PI-420-2 - RCS HL PRESSURE (0-3000 PSIG at MCB) {Cascading Impact}
RCS - PI-420B - RCS PRESSURE (0-3000 PSIG at ABELIP) {Cascading Impact}
RCS - TI-409A-1 - RCS LOOP A HL INDICATION (MCB) {Cascading Impact}
RCS - TI-409B-1 - RCS LOOP A CL INDICATION (MCB) {Cascading Impact}
RHR - FT-689 - RHR LOOP FLOW TRANSMITTER {Cascading Impact}
RHR - PAC01A - RHR PUMP A {Cascading Impact}
SIS - LI-921 - RWST LEVEL {Cascading Impact}
SIS - PSI01A - SI PUMP A {Cascading Impact}
SWS - 4663 - AIR COND MOV {Cascading Impact}
SWS - 9632A - SAFW ROOM A COOLER FCV {Cascading Impact}
SWS - PSW01A - SERVICE WATER PUMP A {L0484(L), L0483(LOCI) and Cascading Impact}
SWS - PSW01C - SERVICE WATER PUMP C {L0484(L), L0487(LOCI) and Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. Plant Modification ESR-12-0142, which provides Cable L0318 with some protection against fire damage, was credited to help resolve this VFDR. No recovery action was credited to resolve this VFDR.

**VFDR ID**

VFDR-BR1B-004

**VFDR**

A MSO concern exists related to BUS14 power supply.
With offsite power available, spurious closure of breaker 52/EG1A2 (cable L0510) can take place with KDG01A idle causing the reverse power relay trip signal to 52/EG1A2 (BUS18) and 52/EG1A1 (BUS14). A simultaneous spurious trip of BUS14 offsite infeed breaker 52/14 (cable L0472) results in a loss of both power sources to BUS14.
With offsite power not available, power to BUS14 can be lost due to the following separation concerns:
(a) A spurious trip of breaker 52/EG1A2 (cable L0510) de-energizes BUS18. This results in a loss of KDG01A cooling water which, in turn, results in the loss of EAC power to BUS14; - OR -
(b) Fire damage to cable L0320 can spuriously open or prevent 52/EG1A1 from closing which would result in loss of power to BUS14

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This VFDR is associated with the Vital Auxiliaries Function [OP017, OP502]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0318(P), L0320 (LOC)}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0318(P), L0510 (LOCI)}
EAC - KDG01A - DIESEL-GENERATOR A {L0530(LCI), L0531(L), L0532(LI), L0536(L), L0537(L), L0554(L), L0560(L) and Cascading Impact}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0472(LO) and Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-BR1B-005

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**VFDR**

A MSO concern exists related to spurious DG start without SW cooling. Credited KDG01A can spuriously start due to cable fire damage (L0530). Concurrent fire damage to cables (L0483 and L0487) can trip credited SW Pumps (PSW01A and PSW01C). This results in KDG01A running without cooling water.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP503]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - KDG01A - DIESEL-GENERATOR A {L0530(LCI), L0531(L), L0532(LI), L0536(L), L0537(L), L0554(L), L0560(L) and Cascading Impact }
SWS - PSW01A - SERVICE WATER PUMP A {L0484(L), L0483(LOCI) and Cascading Impact}
SWS - PSW01C - SERVICE WATER PUMP C {L0484(L), L0487(LOCI) and Cascading Impact}

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No Recovery Action was credited to resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-BR1B-006

**VFDR**

Fire damage to HEMYC wrapped cabling, which is no longer considered "qualified" as a 1-hour rated fire barrier, affects credited KDG01A operation, due to the following separation concerns:
(a) Power to MCCH can be lost as a result of fire damage to cable C0687. Loss of MCCH affects credited Diesel “A” room cooling (ADF01A / ADF01B), DG Fuel Oil Transfer Pump (PDG02A) and DG Fuel Oil Day Tank level transmitter (LIT-2050A).
(b) PDG02A and DG “A” Room cooling fans (ADF01A and ADF01B) are impacted due to fire damage to cable E0022.
(c) Train “A” DC control of credited KDG01A and DG “A” fuel oil day tank SOVs (5907 and 5907A) are impacted due to fire damage to cable E0020.
This VFDR is associated with the Vital Auxiliaries Function. [OE012, OP505, OP507, OP511, OP513]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DBV - ADF01A - EDG A ROOM COOLING FAN {E0022(P) and Cascading Impact}
DBV - ADF01B - EDG A ROOM COOLING FAN {E0022(P) and Cascading Impact}
DGS - 5907 - DG A FUEL OIL DAY TANK SOV {Cascading Impact}
DGS - 5907A - FOTP A RECIRC SOV {Cascading Impact}
DGS - LIT-2050A - A D/G FUEL OIL DAY TANK ALARM & CONTROL {Cascading Impact}
DGS - PDG02A - DG FO TRANSFER PUMP A {E0022(P) and Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0531(L), L0536(L), L0537(L), L0554(L), L0560(L), L0530(LCI), L0532(LI) and Cascading Impact}
LAC - ACPDPDG01 - DIESEL GENERATOR A HEAT TRACE PANEL {Cascading Impact}
LAC - MCCH - MOTOR CONTROL CENTER H {C0687(P), E0022(P) and Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. Plant Modification ESR-12-0142, which provides some fire protection to Cable C0687, was credited to help resolve this VFDR.

| | | |
|---|---|---|
| **Fire Area ID:** | BR1B - Battery Room 1B, Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-BR1B-007

**VFDR**

A SG overfill from the AFW System is postulated when placing credited Train "A" SAFW Pump (PSF01A) in service. AFW Pumps (PAF01B and/or PAF03) can start due to a postulated LOOP. These AFW Pumps cannot be controlled from the MCB due to a loss of Train "B" DC power, while discharge valves from PAF01B (4008), and from PAF03 (3996, 4297 and 4298) fails open on loss of Train "B" power.
This VFDR is associated with the Decay Heat Removal Function. [OP506]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

AFW - 3996 - TDAFWP DISCHARGE MOV {E0093(L) and Cascading Impact}
AFW - 4297 - TDAFWP FCV to S/G A {Cascading Impact}
AFW - 4298 - TDAFWP FCV to S/G B {Cascading Impact}
AFW - PAF01B - AUXILIARY FEEDWATER PUMP B {Cascading Impact}
AFW - PAF03 - TURBINE DRIVEN AUXILIARY FEEDWATER PUMP {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the long time needed for a steam generator to overfill from AFW pumps spuriously running. This long time window ensures that the flow can be stopped before the overfill actually occurs. No recovery action was credited to resolve this VFDR.

**VFDR ID** VFDR-BR1B-008

**VFDR**

Cable L0554 is routed through this fire area and is associated with a current transformer located in fire area EDG1A. Fire damage to this cable can cause a secondary fire in EDG1A that would result in KDG01A being unavailable to support SSD.
This VFDR is associated with the Vital Auxiliaries Function. [OP516]
Impacted Component:
* EAC - KDG01A: DIESEL-GENERATOR A {L0530(LCI), L0531(L), L0532(LI), L0536(L), L0537(L), L0554(L), L0560(L) and Cascading Impact }
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

| | | |
|---|---|---|
| **Fire Area ID:** | BR1B - Battery Room 1B, Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the consideration that secondary fires due to the fire-induced failure of a current transformer have a low probability of occurrence. No recovery action was credited to resolve this VFDR.

**VFDR ID**

VFDR-BR1B-012

**VFDR**

Fire damage to HEMYC wrapped cabling, which is no longer considered "qualified" as a 1-hour rated fire barrier, affects power to credited DC power distribution panel DCPDPAB01A. Loss of cable E0053, results in the loss of control of multiple credited SSD components from the MCB.
This VFDR is associated with the Vital Auxiliaries Function. [OE012, OP512]
This condition represents a variance from the deterministic requirements of Section 4.2.3 of NFPA 805. This is a separation issue.

**Component(s)**

AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {Cascading Impact}
BDC - DCPDPAB01A - AUX BLDG DC DIST PANEL A {E0053(P) and Cascading Impact}
CCW - PAC02A - CCW PUMP A {Cascading Impact}
CVC - PCH01A - CHRG PUMP A {Cascading Impact}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0320(LOC), L0318(P) and Cascading Impact}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0472(LO) and Cascading Impact}
LAC - BUS14 - 480V SWITCHGEAR {L0472(LO), L0320(LOC), L0318(P) and Cascading Impact}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {Cascading Impact}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {Cascading Impact}
RHR - 700 - RHR PUMP SUCTION FROM RCS MOV {Cascading Impact}
RHR - 720 - RHR DISCHARGE TO LOOP B {Cascading Impact}
RHR - PAC01A - RHR PUMP A {Cascading Impact}
SIS - 841 - ACCUM "A" OUTLET {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. Plant Modification ESR-12-0142, which provides some fire protection to Cable C0687, was credited to help resolve this VFDR.

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID** VFDR-BR1B-015

**VFDR**

On a deterministic assumption of loss of offsite power, a spurious opening of breakers 52/EG1A2 (cable L0510) results in a loss of power to credited BUS18. The loss of power to BUS18 impacts KDG01A cooling capability from SW pumps PSW01A and PSW01C.
Local action is taken to stop KDG01A, strip the loads off BUS18, start KDG01A, energize BUS18, start SW Pumps, strip loads off of BUS14, and then energize BUS14.
This VFDR is associated with the Vital Auxiliaries Function. [PH504, PH505, PH516, PH523, PH528]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue and separation issue.

**Component(s)**

ABV - AAF04 - AUXILIARY BUILDING EXHAUST FAN G {Cascading Impact}
AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {Cascading Impact}
AFW - PSF01A - SAFW PUMP C {Cascading Impact}
CCW - PAC02A - CCW PUMP A {Cascading Impact}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A {Cascading Impact}
CVC - PCH01A - CHRG PUMP A {Cascading Impact}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0320(LOC), L0318(P) and Cascading Impact}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0510(LOCI), L0318(P) and Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0531(L), L0536(L), L0537(L), L0554(L), L0560(L), L0530(LCI), L0532(LI) and Cascading Impact}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0472(LO) and Cascading Impact}
LAC - 52/18 - SPT SUPPLY BREAKER TO BUS 18 {Cascading Impact}
LAC - 52/IH1A - BREAKER FOR EHTRCW01A (CIRCULATING WATER INTAKE HEATER A) {L0760(LO) and Cascading Impact}
LAC - 52/IH1C - BREAKER FOR EHTRCW01C (CIRCULATING WATER INTAKE HEATER C) {L0762(LO) and Cascading Impact}
LAC - BUS14 - 480V SWITCHGEAR {L0472(LO), L0320(LOC), L0318(P) and Cascading Impact}
LAC - BUS18 - 480V SWITCHGEAR {L0472(LC), L0469(LOCI), L0510(LOCI), L0318(P) and Cascading Impact}
LAC - MCCC - MOTOR CONTROL CENTER C {Cascading Impact}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {Cascading Impact}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {Cascading Impact}
RCV - ACF08A - CONTAINMENT RECIRCULATING FAN A {Cascading Impact}
RCV - ACF08D - CONTAINMENT RECIRCULATING FAN D {Cascading Impact}

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

RHR - PAC01A - RHR PUMP A {Cascading Impact}
SIS - PSI01A - SI PUMP A {Cascading Impact}
SWS - PSW01A - SERVICE WATER PUMP A {L0484(L), L0483(LOCI) and Cascading Impact}
SWS - PSW01C - SERVICE WATER PUMP C {L0484(L), L0487(LOCI) and Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No Recovery Action was credited to resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-BR1B-016

**VFDR**

Prior to placing the credited CHG Pump PCH01A in service, a suction source from the RWST needs to be established and RCP seal injection needs to be isolated to avoid seal damage.
(a) Normal RWST to CHG Pump suction AOV-112B is subject to spurious closure due to a loss of power from non-credited Train "B" (or due to loss of instrument air); local operator action is required to open manual valve 358 to establish CHG Pump suction from the RWST.
(b) RCP seal cooling can be lost prior to establishing EAC power to BUS14 on a postulated LOOP; local operator action is required to close manual valve 289 to isolate RCP seal injection.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [PH510]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 289 - CHARGING PUMPS DISCHARGE ISOL VLV TO RCP SEAL INJECTION {Requires Operator Action}
CVC - 358 - CHARGING PUMP SUCTION FROM RWST MANUAL IV {Requires Operator Action}
CVC - PCH01A - CHRG PUMP A {Cascading Impact}
IAC - ABELIP - AUX BLDG EMERG LOCAL INSTR PANEL {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID**

VFDR-BR1B-017

**VFDR**

If offsite power is available, a loss of Train "B" Battery and Charger due to a fire in this area results in a loss of control of RCP Pump PRC01B from the MCB. PRC01B may continue to run impacting cooldown control.
Local action is taken to trip the pump at BUS11B.
This VFDR is associated with the Decay Heat Removal Function. [PH512]
Impacted Component:
* RCS - PRC01B: RCP B {E0104(P) and Cascading Impact}
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-BR1B-018

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.
Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 112B, 112C, PCH01A, 625, and 626). However, this action may not be successful due to the integrity of instrument air piping.
This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH515]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION{Cascading Impact, Loss of IA}
CVC - 112C - VCT OUTLET AOV {Cascading Impact, Loss of IA}
CVC - PCH01A - CHRG PUMP A {Cascading Impact}
LAC - BUS13 - 480V SWITCHGEAR {E0107(P) and Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR { E0107(P) and Cascading Impact}

**Fire Area ID:** BR1B - Battery Room 1B, Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}
RHR - 625 - RHR HX A OUTLET {Cascading Impact, Loss of IA}
RHR - 626 - RHR HX BYPASS {Cascading Impact, Loss of IA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**Fire Area ID:** CC - Control Building Complex **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| AHR | 253'-6", Air Handling Room |
| CR | 289'-6", Control Room |
| RR | 271'-0", Relay Room (includes MUX and Annex rooms) |

**Fire Area ID:** CC - Control Building Complex **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core. | Shutdown Method R (Success Path "A") Hot Shutdown |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by train "A" CVCS success path from the RWST to the RCS | Shutdown Method R (Success Path "A") Hot Shutdown |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves and stopping of both RCPs.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Shutdown Method R (Success Path "A") Hot Shutdown |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by the TDAFW Pump success path from the MSS via MOV-3505A and pump suction from the CST or SWS to SG "A" | Shutdown Method R (Success Path "A") Hot Shutdown |
| 5. Process Monitoring Function | RCS Temperature: | Shutdown Method R (Success Path "A") Hot Shutdown |

**Fire Area ID:** CC - Control Building Complex **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | TI-409A-2 (RCS LOOP A HL INDICATION) Location: IBELIP, and TI-409B-2 (RCS LOOP A CL INDICATION) Location: IBELIP.<br>RCS Pressure:PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-428A (PRZR LEVEL (WR)) Location: ABELIP<br>Steam Generator Level:LI-460AA (S/G "A" LEVEL APPENDIX R [0-520" H2O (WR)) Location: IBELIP, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP.<br>Steam Generator Pressure:PI-469A (S/G "A" PRESSURE) Location: IBELIP, PI-2667 (STM SAMP CLR SG "B" PRESS IND) Location: BOP, and PI-2668 (STM SAMP CLR SG "A" PRESS IND) Location: BOP.<br>Neutron Flux Monitoring:<br>N-32R (APPENDIX R SOURCE RANGE MONITOR) Location: IBELIP<br>Tank Level:PI-2808 (CST LOCAL LEVEL INDICATOR) Location: SB-1WT<br>System Flow Rate:FI-2015A (TDAFW PUMP DISCH FLOW) Location: IBELIP<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by trains “A” and “B” of the BDC/IAC System from “A” and “B” batteries, respectively or the TSC Battery System.<br>• AC Power availability is maintained by train “A” Diesel-Generator and train “A” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train “A” SWS success path. | Shutdown Method R (Success Path "A") Hot Shutdown |

**Fire Area ID:** CC - Control Building Complex **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • Ventilation systems for the DG components in the Diesel Building and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

(AHR)

Scenario 1: Suppression Effects in AHR of a Fire Originating In AHR:

Suppression effects (activation of suppression systems and manual firefighting activities) are not expected to extend beyond the area of fire origin. The deluge system in AHR is designed to spray specific cable trays in the Northwest corner of the room.

Scenario 2: Suppression Effects in AHR of a Fire Originating Outside of AHR:

The cable tray deluge system is actuated by the associated fire detection system or manual pull boxes in the basement area which could be vulnerable to a fire originating outside AHR if the detection circuits and/or control panel are routed or located outside the fire zone (e.g., SSA in the Relay Room). However, this system is designed to spray specific cable trays and suppression effects are not expected to extend beyond AHR. Similarly, manual firefighting activities outside of AHR could potentially spray on, and short out an electric manual pull box that could activate the deluge system. However, the system is designed to spray on specific cable trays in the Air Handling Room and suppression effects are not expected to extend beyond AHR.

A floor drain has been provided with backflow protection.

(CR)

**Fire Area ID:** CC - Control Building Complex **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Scenario 1: Suppression Effects in CR of a Fire Originating In CR:

There are no suppression systems in CR and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in CR of a Fire Originating Outside of CR:

There are no suppression systems in CR that could be impacted by operation of a fire suppression system or manual firefighting activities outside of CR.

(RR)

Scenario 1: Suppression Effects in RR of a Fire Originating In RR:

Halon 1301 is an electrically non-conductive clean agent that interrupts the chemical reaction of the fire at concentrations of approximately7 5%. At these low concentrations, automatic actuation of a Halon 1301 system would not be expected to negatively impact safe shutdown related equipment. Moreover, Halon 1301 system discharge does not result in appreciably lowered ambient temperatures or oxygen reduction. The deluge systems in RR are designed to spray specific sections of the Relay Room.

Suppression effects of activation of the Halon 1301 system is not expected to extend beyond the area of fire origin.

The deluge systems are a backup to the Relay Room halon system and are normally kept locked closed with the key under the control of the Shift Manager. If needed, these valves may be unlocked, and the systems actuated either locally or from the Control Room. There is a potential for suppression effects (actuation of the deluge systems and/or manual firefighting activities) to impinge upon the SSA which could then initiate automatic and manual suppression systems in other

areas of the plant.

Scenario 2: Suppression Effects in RR of a Fire Originating Outside of RR:

The only impact a fire in the plant could have on a Halon 1301 system would be to activate the detection system discharging Halon 1301 agent. No other components of the system are vulnerable to fire effects. Other than actuating the system, a fire in the plant would not be expected to impair the operability of the Halon 1301 system.

| | | |
|---|---|---|
| **Fire Area ID:** | CC - Control Building Complex | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

The deluge systems are actuated by manual pull boxes located on the Turbine Building Intermediate Floor which could be vulnerable to a fire originating outside RR if the electrical pull box circuits and/or control panel are routed or located outside the fire zone. However, deluge systems are a backup to the Relay Room halon system and are normally kept locked closed with the key under the control of the Shift Manager. If needed, these valves may be unlocked, and the systems actuated either locally or from the Control Room. It is unlikely this would occur during a fire in the Turbine Building.

Similarly, manual firefighting activities outside of RR could potentially spray on, and short out an electric manual pull box that could activate the Halon 1301 or deluge systems. However, as described above, actuation of a Halon 1301 system would not be expected to negatively impact safe shutdown related equipment, and deluge system valves are normally kept locked closed to inhibit system actuation.

**Fire Area ID:** CC - Control Building Complex **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R, S | Modifications: R S<br>Procedures/Recovery Actions: R |
| AHR | 253'-6", Air Handling Room | E, R | E, R | E | Combustible Loading Controls: E<br>Detection System, S06: E R<br>Water Suppression, S06: E R |
| CR | 289'-6", Control Room | E, D | E, D | E | Combustible Loading Controls: E<br>Detection System, Z19: E D<br>Water Suppression, S29: E D |
| RR | 271'-0", Relay Room (includes MUX and Annex rooms) | E, D | E, R | None | Detection System, Smoke Detectors for S08: R<br>Detection System, Z18: E R<br>Detection System, Z44: E R<br>Gaseous Suppression, Halon Suppression S08: E D<br>Water Suppression, S09: E D<br>Water Suppression, S10: E D<br>Water Suppression, S11: E D |

| | | |
|---|---|---|
| **Fire Area ID:** | CC - Control Building Complex | **Fire Risk Evaluation** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Title**

Fire Risk Evaluation for Fire Area CC

**Risk Summary**

The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-05/rx-yr for the delta CDF, and less than 1E-06/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.Fire Area CC is a fire area where a fire may lead to control room abandonment. In the Fire PRA, the individual pieces of the main control room abandonment strategy are modeled as distinct human failure events, as opposed to the use of a single number for failing to successfully abandon and bring the plant to safe and stable conditions. Thus, in the Fire PRA, this fire area is addressed in a manner similar to other fire areas.

**Δ CDF**

Units: [1] 8.19E-06

**Δ LERF**

Units: [1] 7.40E-07

**DID Maintained**

A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

S06, the fire detection (smoke) and suppression system (automatic deluge) installed in Fire Zone AHR is credited in the Fire PRA. S08, the fire detection (smoke) system is credited in the Fire PRA for Fire Zone RR and the associated fire suppression system (halon) is credited in the Fire PRA for Compartment RR-C1 (Relay Room) of Fire Zone RR. Portable extinguishers are credited by the Fire PRA for all fire zones of the fire area. Given the safety significance of the fire zones in the fire area (relay room and control room), the installed fire detection and suppression systems not credited for risk are credited for DID. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID** VFDR-CC-001

**VFDR**

A deterministic assumption of a loss of offsite power (to BUS13 and BUS15) results in the loss of the Service Air and Instrument Air Systems.
Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is required to manipulate air operated SSD components (i.e., PCH01A, 294, 296).
This VFDR is associated with the Vital Auxiliaries Function. [PH114]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

LAC - BUS13 - 480V SWITCHGEAR {L0327(LO), L0331(LO), L0177(LOCI), L0178(LOCI), L0329(LOCI), L0328(P) and Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {L0187(LO), L0317(LO), L0198(LOC), L0004(LOCI), L0005(LOCI), L0024(P), L0079(P), L0197(P) and Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALV {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM Yard {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-CC-002

**VFDR**

Operator action is taken to locally close Instrument Air Containment Manual Isolation Valve (V-5397) to isolate Instrument Air to Containment. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, PH118]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue.

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CC-003

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**VFDR**

Procedure directed local action to 'de-power' circuits to mitigate spurious operation may not be effective.
Local action is taken in Battery Room "A", at MAIN DC DISTRIBUTION PANEL "A" (DCPDPCB03A), to de-energize MCB DC DIST PNL "A" (DCPDPCB04A) at position #14 which fails components to their respective Loss Of Power position. As no additional local action is taken to ensure the components remain in the desired position, subsequent fire-induced shorts to energized conductors of different circuits in conjunction with fire damage (grounds) could result in spurious operations.
Local action is taken in Battery Room "B", at MAIN DC DISTRIBUTION PANEL "B" (DCPDPCB03B), to de-energize MCB DC DIST PNL "B" (DCPDPCB04B) at position #9 which fails components to their respective Loss Of Power position. As no additional local action is taken to ensure the components remain in the desired position, subsequent fire-induced shorts to energized conductors of different circuits in conjunction with fire damage (grounds) could result in spurious operations.

This VFDR is associated with the Reactivity Control Function, Inventory and Pressure Control Functions, Decay Heat Removal Function, and Vital Auxiliaries Function. [OE010, OP017, OP022, OP023, PH102, PH103]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - 4291 - TURBINE DRIVEN AUXILIARY FEEDWATER PUMP RECIRCULATION AOV {C3537(LC), G0721(LC), G0721B(LC), G0260(LI), G0260A(LI), C3501(P), E0215(P), E0216(P)}
BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Requires Operator Action}
BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Requires Operator Action}
BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {E0049(P), Cascading Impact}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {E0103(P), Cascading Impact}
CCW - 754A - CCW FROM RCP A TB AOV {R0629(LCI)}
CCW - 754B - CCW FROM RCP B TB AOV {R0634(LCI)}

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

CVC - 110B - RMW FLOW CONTROL VLV AOV-110B {R0037(LO), R0034(LOI), E0103(P)}
CVC - 110C - BLENDER OUTLET TO VCT (AOV) {R0037(LO), R0035(LOI)}
CVC - 111 - RMW TO BA BLENDER FLOW CONTROL VLV HCV-111 {R0037(LO), R0036(LOI), E0049(P)}
CVC - 112B - RWST TO CHARGING PUMP SUCTION {R0046(LO), R0056(LOI), Cascading Impact}
CVC - 112C - VCT OUTLET AOV {R0046(LC), R0056(LC), R0060(LCI)}
CVC - 200A - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), E0049(P)}
CVC - 200B - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), E0103(P)}
CVC - 202 - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), E0049(P)}
CVC - 270A - RCP SEAL OUTLET AOV {R0525(LCI), E0049(P)}
CVC - 270B - RCP SEAL OUTLET AOV {R0530(LCI), E0103(P)}
CVC - 294 - CHRG TO LOOP B CL (AOV) {R0535(LOI), E0049(P)}
CVC - 310 - EXCESS LTDN AOV {R3622(L), R3624(L), R0556(LOI)}
CVC - 312 - EXCESS LETDOWN HX DIVERT TO VCT OR RCDT AOV-312 {R0561(LOI), E0103(P)}
CVC - 371 - RCS LETDOWN ISOLATION {R0567A(LO), R0567B(LO), R0567(LOI), E0103(P)}
CVC - 392A - CHRG TO LOOP B HL (AOV) {R0549(LOI)}
CVC - 427 - RCS LETDOWN ISOLATION {E0103(P), R0214(LC), R0215(LCI), R0505(LC), R3685(LC), R3686((LC)}
RCS - 386 - RCP SEAL RETURN BYPASS {R0572(LOI)}
RCS - 590 - REACTOR HEAD VENT OUTER (SOV) TO 592 {SAC0215(L), SAC0211A(LOI)}
RCS - 591 - REACTOR HEAD VENT OUTER (SOV) TO 593 {SAC0216(L), SAC0214(LOI)}
RCS - 592 - REACTOR HEAD VENT INNER (SOV) TO 590 {SAC0215(L), SAC0213(LOI)}
RCS - 593 - REACTOR HEAD VENT INNER (SOV) TO 591 {SAC0216(L), SAC0212A(LOI)}
SIS - 835A - ACCUM A FILL AOV {R0639(LOI)}
SIS - 835B - ACCUM B FILL AOV {R0670(LOI)}

**Disposition** This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action FSHFDMCBDC-B, consisting of locally depowering DC loads, was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-CC-004

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR**

A MSO concern exists related to RWST drain down via Containment Spray actuation. Actuation is possible due to the following separation concerns:
(a) High containment pressure signal from at least two out of three containment pressure transmitters (PT-946, PT-948 and/or PT-950) AND high containment pressure signal from at least two out of three containment pressure transmitters (PT-945, PT-947 and/or PT-949) - OR -
(b) Train "A" Pump (PSI02A) spurious starts and at least one discharge valve (860A or 860B) spuriously opens, OR Train "B" Pump (PSI02B) spurious starts and at least one discharge valve (860C or 860D) spuriously opens
This VFDR is associated with the Inventory and Pressure Control Functions. [OP003, OP017, OP109, OP110]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CSS - 860A - CS PUMP A DISCHARGE {C0757(LO), C0756(LOCI), Cascading Impact}
CSS - 860B - CS PUMP A DISCHARGE {C0820(LO), C1122(LOCI), Cascading Impact}
CSS - 860C - CS PUMP B DISCHARGE {C0757(LO), C0819(LOCI), Cascading Impact}
CSS - 860D - CS PUMP B DISCHARGE {C0820(LO), C1182(LOCI), Cascading Impact}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A {L0339(LC), L0337(LOCI), Cascading Impact}
CSS - PSI02B - CONTAINMENT SPRAY PUMP B {L0217(LC), L0215(LOCI), Cascading Impact}
ESF - PT-945 - CNMT PRESS XMTR {R0895(I), R1140(I), R1141(I), R0896(L), R0897(L), C2518(P), C2612(P)}
ESF - PT-946 - CNMT PRESS XMTR {R0937(I), R1142(I), R1143(I), R0919(L), R0923(L), R0938(L), R0939(L), C2541(P), C2630(P)}
ESF - PT-947 - CNMT PRESS XMTR {R0984(I), R1144(I), R1145(I), R0985(L), R0986(L), R0988(L), R1007(L), C2565(P), C2648(P)}
ESF - PT-948 - CNMT PRESS XMTR {R0940(I), R1147(I), R1148(I), R0976(L), R0986(L), R0988(L), R0989(L), C2565(P), C2648(P)}
ESF - PT-949 - CNMT PRESSURE {R0987(I), R1146(I), R1149(I), R0928(L), R0933(L), R0941(L), R0942(L), C2541(P), C2630(P)}
ESF - PT-950 - PRESSURE TRANSMITTER CONTAINMENT PRESSURE INSTRUMENT LOOP 95 {R1030(I), R1150(I), R1151(I), R1020(L), R1025(L), R1031(L), R1032(L), R0933A(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-CC-005

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR**

A MSO concern exists related to spurious (ESF) Safety Injection Actuation due to fire damaged cabling. Actuation is possible due to the following separation concerns:
(a) Low PZR pressure signal from at least two out of three PZR pressure transmitters (PT-429, PT-430 and/or PT-431) - OR -
(b) Low PZR pressure signal (as above) AND either a low SG-B pressure signal (from at least two out of three SG-B pressure transmitter loops PI-478, PI-479 and/or PT-483) OR a low SG-A pressure signal (from at least two out of three SG -A pressure transmitter loops PT-468, PI-469 and/or PT-482) - OR -
(c) High containment pressure signal from at least two out of the three containment pressure transmitter loops (PT-945, PT-947, and/or PT-949) - OR -
(d) Impact to either Train “A” or “B” SI logic circuits
Local action is taken to mitigate spurious SI actuation by opening breakers at DC power panels. However, operator action to 'de-power' circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP004, OP005, OP006, OP017, OP106, PH102, PH103]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Requires Operator Action}
BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Requires Operator Action}
BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {E0049(P)}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {E0103(P)}
ESF - PT-945 - CNMT PRESS XMTR {C2518(P), C2612(P), R0895(I), R0896(L), R0897(L), R1140(I), R1141(I)}
ESF - PT-947 - CNMT PRESS XMTR {C2565(P), C2648(P), R0984(I), R0985(L), R0986(L), R0988(L), R1007(L), R1144(I), R1145(I)}
ESF - PT-949 - CNMT PRESSURE {C2541(P), C2630(P), R0928(L), R0933(L), R0941(L), R0942(L), R0987(I), R1146(I), R1149(I)}
ESF - SI-TRAIN-A - SAFEGUARDS INITIATION TRAIN A {E0214(), L0354(), L0354A(), L0772(), R3231(), R3232(),R3232A(), R3233(), and Cascading Impact}
ESF - SI-TRAIN-B - SAFEGUARDS INITIATION TRAIN B {E0211(), L0774(), R3231(), R3233(), R3234(), R3235(), R3235A(), and Cascading Impact}
IAC - CVTA1 - INSTRUMENT BUS B CONSTANT VOLTAGE XFMR {C0640(P)}
IAC - IBPDPCBA - INSTR POWER DISTRIBUTION PANEL A {C2536(P) and Cascading Impact}
IAC - IBPDPCBAR - INSTRUMENT BUS A {C2500(P) and Cascading Impact}
IAC - IBPDPCBB - INSTR POWER DISTRIBUTION PANEL B {C2559(P), Cascading Impact}
IAC - IBPDPCBBW - INSTRUMENT BUS B {C0640(P), C2503(P), Cascading Impact}
IAC - IBPDPCBC - INSTR POWER DISTRIBUTION PANEL C {C2583(P) and Cascading Impact}
IAC - IBPDPCBCB - INSTRUMENT BUS C {C2504(P) and Cascading Impact}
MSS - PI-469 - S/G A PRESSURE (MCB) {A0302(I), C2541(P), C2630(P), R0926(I), R0927(L), R0928(L), R0942(L), R1303(I), R4368(I), R4373(I),

| | | |
|---|---|---|
| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

Cascading Impact}}
MSS - PI-478 - S/G B PRESSURE (MCB) {C2565(P), C2648(P), R0975(I), R0976(L), R0977(L), R0982(P), R0989(L), R1327(I), R4376(I), Cascading Impact}}
MSS - PI-479 - S/G B PRESSURE (MCB) {R0933A(P), R1024(I), R1025(L), R1026(L), R1031(L), R4387(I), Cascading Impact}}
MSS - PT-468 - STM GEN A PRESS XMTR {C2518(P), C2612(P), R0886(I), R0887(L), R0888(L), R0892(L), R1275(L), R4372(I), Cascading Impact}
MSS - PT-482 - S/G A STM PRESS XMTR {A0304(I), C2565(P), C2648(P), R0968(L), R0978(I), R0979(L), R0980(L), R1283(I), R1285(I), R1354(I), R4374(I), R4375(I) and Cascading Impact}
MSS - PT-483 - S/G B STM PRESS XMTR {A0303(I), C2630(P), R0931(I), R0932(L), R0933(L), R0941(L), R1335(I), R1337(I), R4386(I), R4389(I), R4410(I) and Cascading Impact}
RPS - PT-429 - PRZR PRESS XMTR {C2517(P), C2566(P), C2613(P), C2651(P), R0809(L), R0907(L), R0908(L), R0909(L), R0910(L), R0913(L), R0914(L), R0915(L), R1069(I), R1070(I), R1071(I), R1073(L), R1082(L), R1083(L), R1086(I), R1087(I), R1088(I), R1089(I), R1090(I) R1090A(I), R1090B(I), R1091(LI), R1092(I), R1093(I), R1094(I), R1095(I), R1095A(I), R1095B(I), R1096(LI), R1097(I), R1099(I), R1100(I), R1100A(I), R1100B(I), R1101(I), R3408(I) and Cascading Impact}
RPS - PT-430 - PRZR PRESS XMTR {C2540(P), C2566(P), C2613(P), C2651(P), R0825(L), R0953(L), R0954(L), R0955(L), R0956(L), R0959(L), R0960(L), R0961(L), R1074(I), R1075(I), R1076(I), R1077(L), R1078(L), R3973(I), R4509(L) and Cascading Impact}
RPS - PT-431 - PRZR PRESS XMTR {C2564(P), 2566(P), 2649(P), C2651(P), R0998(I), R0999(L), R1000(L), R1001(L), R1002(L), R1005(L), R1008(L), R1073(L), R1077(L), R1078(L), R1079(I), R1080(I), R1081(I), R4509(L) and Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CC-006

**VFDR**

A MSO concern exists related to inadvertent PORV (430/431C) actuation as follows:
I. PORV opening and spurious operation/failure of block valves
(a) PORVs (430 and 431C) spuriously open--when required closed for HSD--due to fire damage to SOV cables (8616A, 8619A and 8620A for 430; 8616B, 8619B and 8620B for 431C), - AND -
(b) Block valves (515 and 516) fail open or spuriously open after being closed due to cable fire damage
II. PORV opening due to high pressure signal
(a) High PZR pressure signal from PT-429 and a high PZR signal from either channel 2 (PT-430) or channel 3 (PT-431) actuates 430, - OR -
(b) High PZR pressure signal from PT-431 and a high PZR signal from either channel 1 (PT-429) or channel 4 (PT-449) actuates 431C, - OR -

(c) High PZR pressure signal from at least two out of the three transmitters (PT-450, PT-451 and/or PT-452) actuates BOTH 430 and 431C
Local actions are taken to mitigate spurious operation as follows:
(a) Open breakers at DC power panel. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit. - AND -
(b) Isolate IA to Containment causing the valves to fail closed. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, OE010, OP007, OP008, OP009, OP011, OP017, PH102, PH103, PH118]
Impacted Components: :
* BDC - DCPDPCB03A: MAIN DC DISTRIBUTION PANEL A {Requires Operator Action}
* BDC - DCPDPCB03B: MAIN DC DISTRIBUTION PANEL B {Requires Operator Action }
* BDC - DCPDPCB04A: MAIN CONTROL BOARD DC DIST PANEL A {E0049(P), Cascading Impact}
* BDC - DCPDPCB04B: MAIN CONTROL BOARD DC DIST PANEL B {E0103(P), Cascading Impact}
* IAS - 5397: IA CNMT MAN ISOL VLV {Requires Operator Action}
* IAS - 8619A: N2 ARMING SOV FOR PORV 430 {SAC0211(+)(L), SAC0211-2(L), SAC0211-1(LO), SAC0211A(LO), SAC0211B(LO), SAC0260(LO), SAC0260A(LO), SAC0260B(LO), SAC0266(LO)}
* IAS - 8619B: N2 ARMING SOV FOR PORV 431C {SAC0212(+)(L), SAC0212-2(L), SAC0212-1(LO), SAC0212A(LO), SAC0212B(LO), SAC0259(LO), SAC0259A(LO), SAC0259B(LO), SAC0265(LO)}
* IAS - 8620A: PORV 430 ACTUATION SOV {R0274(LO), R0275(LO), E0103(P)}
* IAS - 8620B: PORV 431C ACTUATION SOV {R0274(LO), R0275(LO), E0103(P)}
* NAS - 8616A: ACCUM TO SURGE TANK SOV FOR PORV 430 {SAC0213(LO)}
* NAS - 8616B: ACCUM TO SURGE TANK SOV FOR PORV 431C {SAC0214(LO)}
* RCS - 430: PORV (AOV) {R0274(LO), R0275(LOI), SAC0211(+)(L), SAC0211-1(LO), SAC0211-2(L), SAC0211A(LO), SAC0211B(LO), SAC0260(LO), SAC0260A(LO), SAC0260B(LO), SAC0266(LO), Cascading Impact}
* RCS - 431C: PORV (AOV) {R0274(LO), R0275(LOI), SAC0212(+)(L), SAC0212-1(LO), SAC0212-2(L), SAC0212A(LO), SAC0212B(LO), SAC0259(LO), SAC0259A(LO), SAC0259B(LO), SAC0265(LO), Cascading Impact}
* RCS - 515: PORV BLOCK VALVE (MOV) FOR 431C {C1060(LOCI), Cascading Impact}
* RCS - 516: PORV BLOCK VALVE (MOV) FOR 430 {C0694(LOCI), Cascading Impact}
* RPS - PT-429: PRZR PRESS XMTR {C2517(P), C2566(P), C2613(P), C2651(P), R0809(L), R0907(L), R0908(L), R0909(L), R0910(L), R0913(L), R0914(L), R0915(L), R1069(I), R1070(I), R1071(I), R1073(L), R1082(L), R1083(L), R1086(I), R1087(I), R1088(I), R1089(I), R1090(I), R1090A(I), R1090B(I), R1091(LI), R1092(I), R1093(I), R1094(I), R1095(I), R1095A(I), R1095B(I), R1096(LI), R1097(I), R1099(I), R1100(I), R1100A(I), R1100B(I), R1101(I), R3408(I), Cascading Impact}

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| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

* RPS - PT-430: PRZR PRESS XMTR {C2540(P), C2566(P), C2631(P), C2651(P), R0825(L), R0953(L), R0954(L), R0955(L), R0956(L), R0959(L), R0960(L), R0961(L), R1074(I), R1075(I), R1076(I), R1077(L), R1078(L), R3973(I), R4509(L)
* RPS - PT-431: PRZR PRESS XMTR {C2564(P), C2566(P), C2651(P), C2649(P), R0998(I), R0999(L), R1000(L), R1001(L), R1002(L), R1005(L), R1008(L), R1073(L), R1077(L), R1078(L), R1079(I), R1080(I), R1080(I), R1081(I), R4509(L), Cascading Impact.
* RPS - PT-449: PRZR PRESS XMTR {C2566(P), C2587(P), C2651(P), C2662(P), R1038(I), R1039(L), R1040(L), R1082(L), R1083(L), R1086(I), R1087(I), R1088(I), R1089(I), R1090(I), R1090A(I), R1090B(I), R1091(LI), R1092(I), R1093(I), R1094(I), R1095(I), R1095A(I), R1095B(I), R1096(LI), R1097(I), R1099(I), R1100(I), R1100A(I), R1100B(I), R1101(I), R1102(I), R1103(I), R1104(I), R1105(I), Cascading Impact}
* RPS - PT-450: RC OVERPRESS PROTECTION XMTR {C2565(P), C2648(P), SAC0219(L), SAC0220(L), SAC0225(L), SAC0226(L), SAI0106(I), Cascading Impact}
* RPS - PT-451: RC OVERPRESS PROTECTION {C2541(P), C2630(P), SAC0221(L), SAC0222(L), SAC0227(L), SAC0228(L), SAI0107(I), Cascading Impact}
* RPS - PT-452: RC OVERPRESS PROTECTION {C2518(P), C2612(P), SAC0223(L), SAC0224(L), SAC0229(L), SAC0230(L), SAI0108(I), Cascading Impact}

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action FSHFDMCBDC-B, consisting of locally depowering DC loads, was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CC-007

**VFDR**

480V power cable C5715 that feeds the non-credited Relay Room Annex Unit Heater (AKU02) is impacted by a fire in this area. Fire damage to this cable creates a breaker coordination concern that results in the loss of ACPDPCD02 long term 120/208V AC power supply capability for credited safe shutdown Instrumentation/Controls and TSC support system components.

This VFDR is associated with the Vital Auxiliaries Function. [OP018]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

LAC - ACPDPCD02 - TECHNICAL SUPPORT CENTER DISTRIBUTION PANEL - TSC2 {C5715(P)}

LAC - ACPDPCD04 - TSC DISTRIBUTION PANEL TSC-4 {Cascading Impact}

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

LAC - BYCTSC - TSC BATTERY CHARGER {Cascading Impact}
TSV - AEF15 - TSC UNINTERRUPTED PS ROOM EXHAUST FAN {Cascading Impact}
TSV - AEF22 - TSC DIESEL-GENERATOR ROOM EXHAUST FAN {Cascading Impact}
TSV - AEF25 - TSC BATTERY ROOM ROOF EXHAUST FAN {Cascading Impact}
TSV - AEF27 - TSC BATTERY ROOM HEATING FAN {Cascading Impact}
TSV - AEF28 - TSC DIESEL-GENERATOR ROOM HEATING FAN {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CC-008

**VFDR**

A MSO concern exists related to BUS14 power supply.
With offsite power available, spurious closure of breaker 52/EG1A2 (cable L0510) can take place with KDG01A idle causing a reverse power relay trip signal to 52/EG1A2 (BUS18) and 52/EG1A1 (BUS14). A simultaneous spurious trip of BUS14 offsite infeed breaker 52/14 (cables L0472, L0315, or L0316) results in a loss of both power sources to BUS14.
With offsite power not available, power to BUS14 can be lost due to the following separation concerns:
(a) A spurious trip of breaker 52/EG1A2 (cable L0510) de-energizes BUS18. This results in a loss of KDG01A cooling water which, in turn, results in the loss of EAC power to BUS14; - OR -
(b) Fire damage to cable L0320 or L0319 can spuriously open or prevent breaker 52/EG1A1 from closing which would result in loss of power to BUS14
This VFDR is associated with the Vital Auxiliaries Function [OP017, OP105]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0320(LOC), L0319(LOCI), Cascading Impact}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0511(L), L0510(LOCI), Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0523(LC), L0524(LC), L0530(LCI), L0531(L), L0532(LI), L0536(L), L0537(L), L0554(L), L0560(L), L0780(LC), L0782(LC), Cascading Impact}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0317(L), L0472(LO), L0315(LOCI), L0316(LOCI)}

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| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Disposition** This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed.No recovery action was credited to resolve the VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0144, which provides a standby Charging pump in the SB AFW building, were credited to help resolve this VFDR.

**VFDR ID** VFDR-CC-009

**VFDR** SG "B" level indication at the PCS (IBELIP) would not be available to support safe shutdown upon postulated fire damage to associated cabling or power supply cabling associated with IBPDPCBAR, IBPDPCBE, and/or RVLMS1.
This VFDR is associated with the Process Monitoring Function. [OP107]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

IAC - IBPDPCBAR - INSTRUMENT BUS A {C2500(P)}
IAC - IBPDPCBE - INSTR POWER DISTRIBUTION PANEL E {C2537(P)}
IAC - RVLMS1 - REACTOR VESSEL LEVEL MONITOR RACK 1 {C3594(P)}
MFW - LI-506A - S/G B WIDE RANGE LEVEL (IBELIP) {R4343(I), R4580(I), C3594(P), Cascading Impact}

**Disposition** This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-CC-010

**VFDR** A MSO concern exists related to CHG pump damage. Fire damage to cables (R0046, R0056 and/or R0060) can spuriously close VCT outlet valve (AOV-112C). RWST outlet valve (AOV-112B) would fail closed on a loss of power when DCPDPCB04B is de-energized by OMA (Refer to VFDR-CC-003). This would result in a loss of CHG pump suction source. The capability to stop any running CHG Pump (PCH01A, PCH01B, PCH01C) from the MCB would not be available due to fire damaged cables (L0397/L0399, L0263/L0269, L0269/L0267, respectively). In particular, a hot short or short to ground affecting Cable L0399 could cause Breaker 52/CHP1A to close, leading to the spurious operation of Charging Pump PCH01A. Similarly, Breaker 52/CHP1B could spuriously close due to a hot short or short to ground affecting Cable L0263. Breaker 52/CHP1C could spuriously close due to a hot short or short to ground affecting Cable L0267. An uncontrolled charging flow from any of the charging pumps challenges the reactor pressure and inventory

control nuclear safety performance criterion (MSO 21).This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OP108, OP017]This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {R0046(LO), R0056(LOI), Cascading Impact}
CVC - 112C - VCT OUTLET AOV {R0046(LC), R0056(LC), R0060(LCI), Cascading Impact}
CVC - PCH01A - CHRG PUMP A {L0397(LOCI), L0399(LOCI), Cascading Impact}
CVC - PCH01B - CHRG PUMP B {L0263(LOCI), L0269(LOCI), Cascading Impact}
CVC - PCH01C - CHRG PUMP C {L0269(LO), L0267(LOCI), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions RCHFDMAKEUP, consisting of locally aligning and starting the new charging system and CVHFDCHGTRIPFIRE, consisting of locally securing the charging pumps, were credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-CC-011

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**VFDR**

A MSO concern exists related to CST Diversion to the Condenser. Fire damage to cable G1488 could spuriously open main condenser hotwell makeup AOV-4315 which would result in premature draining of the CST and damage the in-service AFW Pump(s) due to loss of suction. Control for this AOV is not provided at a PCS.
Local action is taken to fail AOV-4315 in the closed position.
This VFDR is associated with the Decay Heat Removal Function. [OP017, OP111, PH104]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CND - 4315 - MAIN CONDENSER B HOTWELL MAKEUP {A0198(L), G0148(L), R4589(LC), G1488(LO), C3584(P), G0284(P), G0286(P), G0300(P), G0300B(P)}

**Disposition**

Modification ESR-12-0123 (preventing spurious hotwell makeup from CSTs) deterministically resolves this VFDR.

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| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-CC-012

**VFDR** Cable L0554 is routed through this fire area and is associated with a current transformer located in Fire Area EDG1A. Fire damage to this cable could cause a secondary fire in Fire Area EDG1A that results in KDG01A being unavailable to support achieving safe and stable plant conditions.
This VFDR is associated with the Vital Auxiliaries Function. [OP113]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)** EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0523(LC), L0524(LC), L0530(LCI), L0531(L), L0532(LI), L0536(L), L0537(L), L0554(L), L0560(L), L0780(LC), L0782(LC), Cascading Impact }

**Disposition** This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the consideration that secondary fires due to the fire-induced failure of a current transformer have a low probability of occurrence.
No recovery action was credited to resolve this VFDR.

**VFDR ID** VFDR-CC-013

**VFDR** A MSO concern exists related to inadvertent RCS pressure decrease. The scenario is postulated due to the following separation concerns:
(a) Failure of PZR Heaters (EHTRRC01A, EHTRRC02A, EHTRRC01B, and EHTRRC02B), - AND -
(b) Inability to trip and/or spurious start of at least one RCP (PRC01A and/or PRC01B) with spurious opening of PZR Spray valves (AOV-431A and AOV-431B), - AND -
(c) Inability to trip and/or spurious start of at least one CHG Pump (PCH01A, PCH01B, and/or PCH01C) with spurious opening of Auxiliary Spray valve (AOV-296)
Local actions are taken to mitigate spurious operation as follows:
(a) Open breakers at DC power panel. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit. - AND -
(b) Isolate IA to Containment causing the valves to fail closed. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented. - AND -
(c) Stop the RCPs - AND -

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

(d) Stop the CHG Pumps
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, OE010, OP017, OP114, PH102, PH103, PH118]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Requires Operator Action}
BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Requires Operator Action}
CVC - 296 - AUX SPRAY AOV {R0542(LOI), E0049(P)}
CVC - PCH01A - CHRG PUMP A {L0397(LOCI), L0399(LOCI), Cascading Impact}
CVC - PCH01B - CHRG PUMP B {L0263(LOCI), L0269(LOCI), Cascading Impact}
CVC - PCH01C - CHRG PUMP C {L0269(LO), L0267(LOCI), Cascading Impact}
IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}
RCS - 431A - PZR SPRAY VALVE (AOV) {R1091(LOC), C2651(P), Cascading Impact}
RCS - 431B - PZR SPRAY VALVE (AOV) {R1096(LOC), C2651(P), Cascading Impact}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0200(LO), L0278(LO), L0381(LOCI), R1101(OC), Cascading Impact}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {L0269(L), L0278(LC), L0277(LOCI)}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0200(LO), L0278(LO), L0381(LOCI), R1101(OC), Cascading Impact}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {L0269(L), L0278(LC), L0277(LOCI)}
RCS - PRC01A - RCP A {M0050(LC), M0047(LOCI), E0025(P), M0045(P)}
RCS - PRC01B - RCP B {M0145(LC), M0142(LOCI), E0104(P), M0140(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action FSHFDMCBDC-B, consisting of locally depowering DC loads, was credited to help resolve this VFDR. Recovery Action CVHFDCHGTRIPFIRE, consisting of locally securing the charging pumps, is also credited. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-CC-014

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**VFDR**

Fire damage to cables (E0036 and E0112) results in spurious operation of both SG MOVs (3504A and 3505A) to the TDAFW Pump. These valves can spuriously close when required open adversely impacting the ability to remove decay heat.

Local action is taken to de-energize the valve circuits at DCPDPCB03A and DCPDPCB03B. Local action to reposition the MOV is considered unsuccessful due to IN 92-18 concerns ("Hot Short Damaged" due to spurious operation as identified in DA-EE-2000-066 - Attachment G).
This VFDR is associated with the Decay Heat Removal Function. [OP001, OP017, PH102, PH103, PH121]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - PAF03 - TURBINE DRIVEN AUXILIARY FEEDWATER PUMP {Cascading Impact}
BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Requires Operator Action}
BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Requires Operator Action}
MSS - 3504A - SG B TO TDAFWP {E0039(LO), G0403(LO), E0112(LOCI), E0108(P), Cascading Impact}
MSS - 3505A - SG A TO TDAFWP {E0039(LO), G0403(LO), E0036(LOCI), E0032(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the initial water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

**VFDR ID** VFDR-CC-015

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**VFDR**

If offsite power is available, cable fire damage can prevent tripping RCPs (PRC01A and PRC01B) and MFW pumps (PFW01A and PFW01B) from the MCB prior to evacuation. Any of these pumps continuing to run after reactor trip will have an adverse impact on RCS cool-down rate. If the MCR trip is successful, subsequent cable fire damage may cause a pump restart.
Local action is taken at their associated 4kV bus to trip each pump, since none of the pumps are controlled from a PCS.
This VFDR is associated with the Decay Heat Removal Function. [OP017, PH107, PH108, PH109, PH110]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

MFW - PFW01A - MFW PUMP A {M0042(LO), M0043(LO), M0160(LO), M0035(LOI), E0025(P)}

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| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

MFW - PFW01B - MFW PUMP B {M0043(LO), M0159(LO), M0160(LO), M0152(LOI), E0104(P)}
RCS - PRC01A - RCP A {M0050(LC), M0047(LOCI), E0025(P), M0045(P)}
RCS - PRC01B - RCP B {M0145(LC), M0142(LOCI), E0104(P), M0140(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CC-016

**VFDR**

Sampling system isolation valves may spuriously open due to cable fire damage resulting in a minor RCS inventory loss.
Local action is taken to:
(a) Open breaker #11 in Turbine Building DC Distribution Panel DCPDPTB01B to de-energize the Nuclear Sample Panel (NSP) to isolate these valves. This action may be ineffective if the spurious operation(s) was caused by a short to an energized conductor of a different circuit concurrent with fire damage (grounds) to both circuits.
(b) Isolate IA to Containment causing AOVs (951, 953 and 955) to fail closed. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented.
This VFDR is associated with the Decay Heat Removal Function, and Inventory and Pressure Control Functions. [OE001, OE010, OP017, PH113, PH118]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPTB01B - TURBINE BLDG DC DISTRIBUTION PANEL {Requires Operator Action}
IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}
LAC - NSP - NUCLEAR SAMPLING PANEL {Cascading Impact}
PSS - 951 - PZR STEAM SAMPLE AOV {R3151(LO), R3152(LO), R3140(LOI)}
PSS - 953 - PZR WATER SAMPLE AOV {R3151(LO), R3152(LO), R3150(LOI)}
PSS - 955 - LOOP B HL SAMPLE {R3151(LO), R3152(LO), R3150(LOI)}
PSS - 966A - PZR STEAM SAMPLE AOV {R3172(LO), R3173(LO), R3171(LOI)}
PSS - 966B - PZR LIQUID SAMPLE AOV {R3172(LO), R3173(LO), R3171(LOI)}
PSS - 966C - LOOP B HL SAMPLE {R3172(LO), R3173(LO), R3163(LOI)}

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

SGB - 5737 - SGB B AOV {G0401(LO), M0201(LO), R3194(LO), R3195(LO), R3196(LO), R3197(LO), R3198(LO), R3199(LO), R3192(LOI)}
SGB - 5738 - SGB A AOV {G0403(LO), M0200(LO), R3194(LO), R3195(LO), R3196(LO), R3197(LO), R3198(LO), R3199(LO), R3192(LOI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CC-017

**VFDR**

A MSO concern exists related to inadvertent Steam Dumping as follows:
(a) Cable fire damage can prevent one or both MSIVs from closing - AND -
(b) Loss of power from ACPDPCB03 can fail open MSS valves to moisture separator reheaters (3425, 3425A, 3426, 3426A, 3427, 3427A, 3428, and 3428A) -AND/OR-
(c) Loss of power to solenoid valves 20/AST and 5501S3 disables the turbine trip function of these valves, preventing them from closing Turbine Inlet Valves (3544, 3545, 3462, 3463, 3464, and 3465)
(d) Cable fire damage can spuriously open Steam Dump Valves (3349, 3350, 3351, 3352, 3353, 3354, 3355, 3356)
Local action is taken to mitigate spurious actuation by opening breakers at DC power panels. However, operator action to 'de-power' circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit. Since none of the components can be controlled from a PCS, local action is taken to close both MSIVs.
This VFDR is associated with the Decay Heat Removal Function. [OE010, OP112, PH101a, PH102, PH103, PH116]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

IAS - 5408A - IA ISOL VALVE to AOV-3517, A MSIV {Requires Operator Action}
IAS - 5409B - IA ISOL VALVE TO S/G B MSIV {Requires Operator Action}
IAS - 5471 - A MSIV EMERG VENT {Requires Operator Action}
IAS - 5472 - B MSIV EMERG VENT {Requires Operator Action}
IAS - 5473 - A MSIV EMERG VENT {Requires Operator Action}
IAS - 5474 - B MSIV EMERG VENT {Requires Operator Action}
LAC - ACPDPCB03 - CONTROL BUILDING 120/208V DISTRIBUTION PANEL B1 {C2066(P), C2066A(P), L0038(P), L0834(LCI), Cascading

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| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

Impact}
LAC - ACPDPTB07 - TURBINE BUILDING MISCELLANEOUS 120V DISTRIBUTION PANEL A {C2068(P), Cascading Impact}
LAC - ACPDPTB10 - TURBINE BUILDING MISCELLANEOUS 120V DISTRIBUTION PANEL B {Cascading Impact}
MSS - 3349 - STEAM GEN CONDENSER STEAM DUMP VLV {G0797(L), G0834(L), G0764(LI), G0765(LO), G0780(LO), G0799(LO)}
MSS - 3350 - STEAM GEN CONDENSER STEAM DUMP VLV {G0828(L), G0829(L), G0832(L), G0833(L), G0804(LI), G0805(LO), G0819(LO), G0830(LO)}
MSS - 3351 - STEAM GEN CONDENSER STEAM DUMP VLV {G0797(L), G0834(L), G0764(LI), G0765(LO), G0780(LO), G0799(LO)}
MSS - 3352 - STEAM GEN CONDENSER STEAM DUMP VLV {G0828(L), G0829(L), G0832(L), G0833(L), G0804(LI), G0805(LO), G0819(LO), G0830(LO)}
MSS - 3353 - STEAM GEN CONDENSER STEAM DUMP VLV {G0779(L), G0796(L), G0834(L), G0764(LI), G0765(LO), G0780(LO), G0799(LO)}
MSS - 3354 - STEAM GEN CONDENSER STEAM DUMP VLV {G0828(L), G0829(L), G0832(L), G0833(L), G0804(LI), G0805(LO), G0819(LO), G0830(LO)}
MSS - 3355 - STEAM GEN CONDENSER STEAM DUMP VLV {G0779(L), G0796(L), G0834(L), G0764(LI), G0765(LO), G0780(LO), G0799(LO)}
MSS - 3356 - STEAM GEN CONDENSER STEAM DUMP VLV {G0828(L), G0829(L), G0832(L), G0833(L), G0804(LI), G0805(LO), G0819(LO), G0830(LO)}
MSS - 3425 - MAIN STEAM CONTROL AOV TO MSR 1A {G0067(L), Cascading Impact}
MSS - 3425A - MOISTURE SEPARATOR REHEATER 1A MINI WARMUP AIR OPERATED VALV {G0067(L), Cascading Impact}
MSS - 3426 - MAIN STEAM CONTROL AOV TO MSR 1B {G0067(L), Cascading Impact}
MSS - 3426A - MSR 1B MINI WARM-UP AOV {G0067(L), Cascading Impact}
MSS - 3427 - MAIN STEAM CONTROL AOV TO MSR 2A {G0067(L), Cascading Impact}
MSS - 3427A - MSR 2A MINI WARMUP AOV {G0067(L), Cascading Impact}
MSS - 3428 - MAIN STEAM CONTROL AOV TO MSR 2B {G0067(L), Cascading Impact}
MSS - 3428A - MSR 2B MINI WARMUP AOV {G0067(L), Cascading Impact}
MSS - 3516 - MSIV B {G1180(L), G0712(LC), G0714A(LC), G1181(LC), G1184(LC), G1196(LC), G1198(LC), G1197(LI), E0212(P), E0215(P), E0216(P), Cascading Impact}
MSS - 3517 - MSIV A {G1186(L), G0713(LC), G0715(LC), G1184(LC), G1187(LC), G1192(LC), G1196(LC), G1191(LI), E0212(P), E0215(P), E0216(P), Cascading Impact}
MSS - STEAM-DUMP-CONTROL - STEAM DUMP CONTROLS {Pseudo}
TGS - 20/AST - TURBINE AUTO STOP TRIP SOLENOID (20/AST) {E0215(P), E0216(P), G0056(LO), G0057(LO), G0064(LO), G0064A(L), G1403(LO), Cascading Impact}
TGS - 3462 - HP TURB E/H GOV VLV {Cascading Impact}
TGS - 3463 - HP TURB E/H GOV VLV {Cascading Impact}
TGS - 3464 - HP TURB E/H GOV VLV {Cascading Impact}}

| | |
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| | TGS - 3465 - HP TURB E/H GOV VLV {Cascading Impact}}<br>TGS - 3544 - HP TURBINE MAIN STEAM STOP VLV {Cascading Impact}<br>TGS - 3545 - HP TURBINE MAIN STEAM STOP VLV {Cascading Impact}<br>TGS - 5501S3 - TURBINE EMERGENCY TRIP SOLENOID VALVE (20/ET) {E0212(P), E0216(P), G0058(LO), G0059(LO), G0064B(LO), G0065(LO), G0065A(LO), G1404(LO), Cascading Impact} |
| **Disposition** | Modification ESR-12-0128, which ensures automatic MSIV closure, deterministically resolves this VFDR. |
| **VFDR ID** | VFDR-CC-018 |
| **VFDR** | PCS instrumentation is not available for CST level indication.<br>Local action is taken to monitor local gauge PI-2808 from behind CST "B".<br>This VFDR is associated with the Process Monitoring Function. [PH120]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue. |
| **Component(s)** | CND - PI-2808 - CST LOCAL LEVEL INDICATOR {Requires Operator Action} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system, was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-CC-019 |
| **VFDR** | Cable fire damage can prevent supplying AFW to the SGs; adversely impacting the ability to remove decay heat. Fire damage to control cable E0093 can prevent operation of MOV-3996 at the IBELIP.<br>Since it cannot be controlled from the PCS, local action is taken to manually control the valve to establish AFW flow. However, establishing AFW flow may not be possible due to IN 92-18 issues related to MOV-3996. Additionally, SG B FCV 4298 could fail open due to fire damage to power cable |

(C3548); therefore, manual isolation valve 4002 is closed in order to ensure the success path to SG A is maintained.
This VFDR is associated with the Decay Heat Removal Function. [OP001, OP017, PH121, PH136]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - 3996 - TDAFWP DISCHARGE MOV {E0093(L), E0097(LOCI)}
AFW - 4002 - AOV-4298 OUTLET BLOCK VALVE {Requires Operator Action}
AFW - 4298 - TDAFWP FCV TO S/G B {C3584(P), G0901(LC) and Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the initial water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

**VFDR ID**

VFDR-CC-020

**VFDR**

A MSO concern exists related to BUS14 and BUS18 power supply. The scenario is postulated due to the following separation concerns:
(a) Loss of control of KDG01A (cables L0780 and L0782) can prevent MCB action to start the DG and spurious opening of breaker 52/18 (cable L0206) if offsite power is available, results in a loss of power to credited BUS18
(b) Spurious opening or failure to close of breaker 52/EG1A1 (cable L0319) and spurious opening of breaker 52/14 (cable L0315) if offsite power is available, results in a loss of power to credited BUS14
Local action is taken to control KDG01A, strip the loads off BUS14/BUS18, start KDG01A, start SW Pumps (BUS18) and load BUS14.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, PH111, PH115, PH112, PH122, PH128]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

ABV - AAF04 - AUXILIARY BUILDING EXHAUST FAN G {G0947(LO), L0732(LO), Cascading Impact}
AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {G0401(L), G1401(L), L0374(L), G0409(LC), G0410(LC), L0375(LC), L0373(LOCI)}

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

AFW - PSF01A - SAFW PUMP C {FWL0010(LI), L0744(LO), Cascading Impact}
CCW - PAC02A - CCW PUMP A {L0386(L), L0862(LC), L0395(LOCI), Cascading Impact}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A {L0339(LO), L0337(LOCI), Cascading Impact}
CVC - PCH01A - CHRG PUMP A {L0397(LOCI), L0399(LOCI), Cascading Impact}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0320(LOC), L0319(LOCI), Cascading Impact}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0511(L), L0510(LOCI), Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0523(LC), L0524(LC), L0530(LCI), L0531(L), L0532(LI), L0536(L), L0537(L), L0554(L), L0560(L), L0780(LC), L0782(LC), Cascading Impact }
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0317(L), L0472(LO), L0315(LOCI), L0316(LOCI)}
LAC - 52/18 - SPT SUPPLY BREAKER TO BUS 18 {L0317(L), L0206(LO), L0504(LO), L0506(LOCI), Cascading Impact}
LAC - 52/BT14-13 - BKR FOR BUS14 TO BUS13 TIE {L0177(LC), L0327(LO), L0331(LO), L0329(LOCI), L0328(P), Cascading Impact}
LAC - 52/IH1A - BREAKER FOR EHTRCW01A (CIRCULATING WATER INTAKE HEATER A) {L0760(LO), Cascading Impact}
LAC - 52/IH1C - BREAKER FOR EHTRCW01C (CIRCULATING WATER INTAKE HEATER C) {L0762(LO), Cascading Impact}
LAC - 52/MCC1G1 - MOTOR CONTROL CENTER G SUPPLY G1 {L0499(LOCI), Cascading Impact}
LAC - BUS14 - 480V SWITCHGEAR {L0317(L), M0099(L), L0177(LC), L0327(LO), L0331(LO), L0472(LO), L0776(LO), L0320(LOC), L0315(LOCI), L0316(LOCI), L0319(LOCI), L0329(LOCI), M0095(LOCI), E0026(P), L0328(P), M0096(PI), Cascading Impact}
LAC - BUS18 - 480V SWITCHGEAR {L0511(L), M0099(L), L0430(LC), L0472(LC), L0206(LO), L0317(LO), L0504(LO), L0779(LO), L0469(LOCI), L0506(LOCI), L0510(LOCI), M0090(LOCI), E0026(P), M0091(PI), Cascading Impact}
LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOC), Cascading Impact}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0200(LO), L0278(LO), L0381(LOCI), R1101(OC), Cascading Impact}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0200(LO), L0278(LO), L0381(LOCI), R1101(OC), Cascading Impact}
RCV - ACF08A - CONTAINMENT RECIRCULATING FAN A {L0355(LC), L0353(LOCI), Cascading Impact}
RCV - ACF08D - CONTAINMENT RECIRCULATING FAN D {L0355(LC), L0364(LOCI), Cascading Impact}
RHR - PAC01A - RHR PUMP A {L0380(LC), L0378(LOCI), Cascading Impact}
SIS - PSI01A - SI PUMP A {L0335(LC), L0333(LOCI)and Cascading Impact}
SIS - PSI01C - SI PUMP C {L0201(LC), L0386(LC), L0210(LOCI), L0325(LOCI), Cascading Impact}
SWS - PSW01A - SERVICE WATER PUMP A {L0484(L), L0479(LC), L0483(LOCI), L0485(LOCI), Cascading Impact}
SWS - PSW01C - SERVICE WATER PUMP C {L0484(L), L0479(LC), L0487(LOCI), L0488(LOCI), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed.No recovery action was credited to resolve the VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0144, which provides a standby Charging pump in the SB AFW building, were credited to help resolve this VFDR.

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| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-CC-021

**VFDR**

Fire damage (line to ground fault or open circuit) to cable L0684 simulates an undervoltage signal which will strip BUS14 loads.
Local action is taken to disable circuitry at the UNDERVOLTAGE RELAY CABINET by removing DC fuse blocks FUARA1RC 14/2-P and FUARA1RC 14/3-N for BUS14.
This VFDR is associated with the Vital Auxiliaries Function. [PH123]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

LAC - UVBUS14 - BUS 14 UV CIRCUITRY {E0274(), E0274A(), E0274B(), E0275(), E0286(), E0287(), L0312(), L0673(), L0681(), L0684(), L0686(), L0687(), L0688(), L0689(), L0876A(), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0144, which provides a standby Charging pump in the SB AFW building, were credited to help resolve this VFDR.

**VFDR ID** VFDR-CC-022

**VFDR**

Containment sump MOVs (850A and 850B) are subject to spurious opening. MOV-856 is required to be closed to prevent RWST drain down to the sump during HSD. Fire damage to cable C0790 can spuriously open 856, bypassing the control power key switch (1/856-KS on MCB).
Local action is taken to open the breaker for 856 at MCCC AND locally close the valve.
This VFDR is associated with the Inventory and Pressure Control Functions. [OP010, OP017, OMH001, PH125]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

LAC - MCCC - MOTOR CONTROL CENTER C {Requires Operator Action}
RHR - 850A - CNMT SUMP TO RHR PUMP MOV {C0705(L), C0704(LOCI)}

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| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

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| | RHR - 850B - CNMT SUMP TO RHR PUMP MOV {C1071(L), C1070(LOCI)}<br>RHR - 856 - RWST TO RHR MOV {C0791(L), C0790(LOCI), Requires Operator Action} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR. |
| **VFDR ID** | VFDR-CC-023 |
| **VFDR** | CHG Pump FCV-142 is subject to spurious closure due to a hot short to cable R0150.<br>Local action is taken to open bypass valve 384C.<br>This VFDR is associated with the Inventory and Pressure Control Functions. [OP017, PH126]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue. |
| **Component(s)** | CVC - 142 - CHRG FCV {R0150(LOC), C3584(P)}<br>CVC - 384C - AOV 142 BYP VLV {Requires Operator Action} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR. |
| **VFDR ID** | VFDR-CC-024 |
| **VFDR** | MOV-313 is subject to spurious opening (fire damage to cable C0872).<br>Local action to reposition the MOV is considered unsuccessful due to IN 92-18 concerns ("Hot Short Damaged" due to spurious operation as identified in DA-EE-2000-066 - Attachment G). Therefore, local action is taken to close manual valves V-315A and V-315C to isolate RCP seal return to the VCT.<br>This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OP001, PH127] |

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 313 - SEAL OR EXCESS LETDOWN RETURN ISOLATION MOV {C0872(LOCI), C0873(LI)}, C0874(LC)}
CVC - 315A - INLET BLOCK VALVE TO SEAL RETURN FILTER {Requires Operator Action}
CVC - 315C - SEAL RETURN FILTER BYPASS VLV {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID** VFDR-CC-025

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**VFDR**

For a postulated fire in the Control Complex, VCT Outlet AOV-112C can fail open due to:
(a) Loss of instrument air -OR-
(b) Loss of power (either due to fire damage to DCPDPCB04A cable E0049, or when panel is de-energized by OMA to mitigate spurious actuations).
Failure of VCT Outlet AOV-112C to remain closed would result in charging pump failure upon loss of VCT water inventory.
Local action is taken to transfer control of the CVC System as follows:
(a) Align RWST suction source by opening manual valve 358.
(b) Close manual valve 289 to isolate RCP seal injection.
(c) Isolate VCT cover gas (close 261 and 262).
(d) Control PCH01A locally from the ABELIP (PCS).
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [PH129, PH130]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 112C - VCT OUTLET AOV {R0046(LC), R0056(LC), R0060(LCI), Cascading Impact}
CVC - 261 - VCT H2 INLT MANUAL BLK VLV {Requires Operator Action}
CVC - 262 - VCT NITROGEN INLET MANUAL BLK VLV {Requires Operator Action}

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

CVC - 289 - CHARGING PUMPS DISCHARGE ISOL VLV TO RCP SEAL INJECTION {Requires Operator Action}
CVC - 358 - CHARGING PUMP SUCTION FROM RWST MANUAL IV {Requires Operator Action}
CVC - PCH01A - CHRG PUMP A {L0397 (LOCI), L0399 (LOCI), PCS Action}
IAC - ABELIP - AUX BLDG EMERG LOCAL INSTR PANEL {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-CC-026

**VFDR**

If offsite power is available - OR - non-credited KDG01B spuriously starts (due to fire damaged cable(s) L0525, L0784, and/or L0570) -AND- connects to BUS16 (via spurious closure of 52/EG1B1 due to fire damaged cables L0190 and/or L0189), various loads on the non-credited bus (i.e., PAF01B, PAC02B, PSI02B, PCH01B, PCH01C, 52/BT16-15, MCCD, EHTRRC01B, EHTRRC02B, PAC01B, PSI01B, PSI01C, etc.) could be in-service or spuriously energize and challenge the controlled shutdown of the plant.
Local action is taken to remove all Supply, Bus Tie, and Load Breaker 125V DC fuses -AND- open all 480V AC breakers at BUS16 to isolate BUS16.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, PH131]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - PAF01B - AUXILIARY FEEDWATER PUMP B {G0401(L), G1402(L), L0253(L), G0411(LC), G0412(LC), L0254(LC), L0373(LO), L0252(LOCI)}
AFW - PSF01B - SAFW PUMP D {FWL0028(LI), L0723(LO), Cascading Impact}
CCW - PAC02B - CCW PUMP B {L0280(L), L0285(LC), L0282(LOCI), Cascading Impact}
CSS - PSI02B - CONTAINMENT SPRAY PUMP B {L0217(LC), L0215(LOCI), Cascading Impact}
CVC - PCH01B - CHRG PUMP B {L0263(LOCI), L0269(LOCI), Cascading Impact}
CVC - PCH01C - CHRG PUMP C {L0269(LO), L0267(LOCI)}
EAC - 52/EG1B1 - EDG B SUPPLY TO BUS 16 {L0190(LOC), L0189(LOCI), Cascading Impact}
EAC - KDG01B - DIESEL-GENERATOR B {L0576(L), L0577(L), L0594(L), L0600(L), L0786(L), L0525(LC), L0784(LC), L0526(LO), L0571(LO), L0570(LOCI), L0572(LOI) and Cascading Impact}

| | | |
|---|---|---|
| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

LAC - 52/16 - SPT SUPPLY BREAKER TO BUS 16 {L0187(L), L0180(LO), L0184(LOCI), L0186(LOCI)}
LAC - 52/BT16-14 - BREAKER FOR BUS 16 TO BUS 14 TIE {L0206(LC), L0204(LOCI)}
LAC - 52/BT16-15 - BREAKER FOR BUS 16 TO BUS 15 TIE {L0004(LC), L0187(LO), L0317(LO), L0198(LOCI), L0197(P), Cascading Impact}
LAC - BUS16 - 480V SWITCHGEAR {L0004(LC), L0206(LC), L0180(LO), L0187(LO), L0777(LO), M0107(LO), M0266(LO), L0190(LOC), L0184(LOCI), L0186(LOCI), L0189(LOCI), L0198(LOCI), L0204(LOCI), M0104(LOCI), E0105(P), M0105(PI)}
LAC - MCCD - MOTOR CONTROL CENTER D {L0289(LOC)}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {L0269(L), L0278(LC), L0277(LOCI)}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {L0269(L), L0278(LC), L0277(LOCI)}
RCV - ACF08B - CONTAINMENT RECIRCULATING FAN B {L0366(LC), L0225(LOCI), Cascading Impact}
RCV - ACF08C - CONTAINMENT RECIRCULATING FAN C {L0366(LC), L0240(LOCI), Cascading Impact}
RHR - PAC01B - RHR PUMP B {L0261(LC), L0259(LOCI), Cascading Impact}
SFP - PAC07B - SPENT FUEL POOL RECIRCULATING PUMP B {L0719(LO), Cascading Impact}
SIS - PSI01B - SI PUMP B {L0196(LC), L0194(LOCI), Cascading Impact}
SIS - PSI01C - SI PUMP C {L0201(LC), L0386(LC), L0210(LOCI), L0325(LOCI), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0144, which provides a standby Charging pump in the SB AFW building, were credited to help resolve this VFDR.

**VFDR ID**

VFDR-CC-027

**VFDR**

The credited TDAFW Pump suction cannot be aligned to SW from MOV-4013 due to cable C1216 fire damage or a loss of AC power to MOV-4013 from non-credited BUS16.
Local actions are required when CST level indicates less than 5 feet on local indicator PI-2808 (normal CST re-fill capability is not credited). In addition, suction line drain valve 4358D is normally open and required to be closed before normally closed in-series manual isolation valve 4098 and MOV-4013 are opened.
This VFDR is associated with the Decay Heat Removal Function. [OP017, PH134]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

AFW - 4098 - TDAFWP SUCTION FROM SWS MANUAL IV {Requires Operator Action}
AFW - 4358D - TDAFW PUMP SW SUCTION LINE TELLTALE ISOL VLV {Requires Operator Action}
CND - PI-2808 - CST LOCAL LEVEL INDICATOR {Requires Operator Action}
LAC - MCCD - MOTOR CONTROL CENTER D {Requires Operator Action}
SWS - 4013 - TDAFWP SW SUCTION MOV {C1215(LI), C1216(LOCI), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the initial water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

**VFDR ID**

VFDR-CC-029

**VFDR**

Fire damage to Battery Charger "A" (BYCA1) cable C5191, cascading loss of power (deterministic analysis) to Battery Charger "B" (BYCB1), fire damage to TSC 125V DC feeder cables E0277A, E0277B, E0278A, and E0278B to Battery Bus "A", and fire damage to TSC 125V DC feeder cables E0279A and E0279B to Battery Bus "B" is postulated to cause a loss of long-term 125V DC power for credited Safe Shutdown instrumentation and components.
Local action is taken to repair damaged cables between DCPDPTB02, DCPDPCB05A, DCPDPCB05B, and DCPDPCB02A,--AND- align the TSC DC supply to provide power for long term operation of:
(a) ABELIP and DG "A" Fuel Oil Transfer Pump (PDG02A)from DCPDPCB02A -AND-.
(b) IBELIP and TDAFW Pump DC LUBE OIL Pump (PLO11) from DCPDPCB02B.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP101, OP102, OP103, PC122, PC123, PC124, PC125, PC126]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - PLO11 - TDAFWP DC LUBE OIL PUMP {E0193(LCI), Cascading Impact}
BDC - BYCA1 - BATTERY CHARGER A1 {C5191(P)}
BDC - BYCB1 - BATTERY CHARGER A1 {Cascading Impact}
BDC - DCPDPCB01A - BATTERY A MAIN DISCONNECT {Cascading Impact, Requires Operator Action}

| | | |
|---|---|---|
| **Fire Area ID:** | CC - Control Building Complex | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

BDC - DCPDPCB01B - BATTERY B MAIN DISCONNECT {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB02A - BATTERY A MAIN FUSE CABINET {E0278A(P), E0278B(P), Cascading Impact, Requires Operator Action}
BDC - DCPDPCB02B - BATTERY B MAIN FUSE CABINET {Requires Operator Action}
BDC - DCPDPCB05A - TSC BATTERY A FUSED DISCONNECT {E0277A(P), E0277B(P), Cascading Impact, Requires Operator Action}
BDC - DCPDPCB05B - TSC BATTERY B FUSED DISCONNECT {E0279A(P), E0279B(P), Cascading Impact, Requires Operator Action}
BDC - DCPDPCD01 - TSC BATTERY A & B FUSED DISCONNECT {Requires Operator Action}
BDC - DCPDPTB02 - TSC TO BATTERY A & B THROWOVER SWITCH {Requires Operator Action}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
IAC - ABELIP - AUX BLDG EMERG LOCAL INSTR PANEL {Cascading Impact}
IAC - IBELIP - INTERMEDIATE BLDG EMERG LOCAL INSTR PANEL {Cascading Impact}
LAC - 52/15 - BKR FOR BUS 15 SUPPLY {L0198(LC), L0004(LOCI), L0005(LOCI), Requires Operator Action}
LAC - 52/BT16-15 - BREAKER FOR BUS 16 TO BUS 15 TIE {L0004(LC), L0187(LO), L0317(LO), L0198(LOCI), L0197(P), Requires Operator Action}
LAC - BUS15 - 480V SWITCHGEAR {L0187(LO), L0317(LO), L0198(LOC), L0004(LOCI), L0005(LOCI), L0024(P), L0079(P), L0197(P), Requires Operator Action}
LAC - BUS16 - 480V SWITCHGEAR {L0004(LC), L0206(LC), L0180(LO), L0187(LO), L0777(LO), M0107(LO), M0266(LO), L0190(LOC), L0184(LOCI), L0186(LOCI), L0189(LOCI), L0198(LOCI), L0204(LOCI), M0104(LOCI), E0105(P), M0105(PI)}
LAC - BYCTSC - TSC BATTERY CHARGER {Requires Operator Action}
LAC - KED03 - TSC EMERGENCY DIESEL-GENERATOR {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions DCHFDTSCLT and FSHFDTSCLT-DR, respectively consisting of aligning the TSC diesel generator and the TSC battery charger, were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CC-041

**VFDR**

A MSO concern exists related to Reactor Trip capability. Fire damaged cabling would result in the Reactor Trip breaker “open” function being unavailable as follows:
(a) 52/RTA: A line-ground fault (to cable L0611 or E0224) would result in the loss of Trip Coil capability AND a hot short (to cable L0610) would result in the loss of UV Trip Coil capability
- AND -

(b) 52/RTB: A line-ground fault (to cable L0631 or E0233) would result in the loss of Trip Coil capability AND a hot short (to cable L0630) would result in the loss of UV Trip Coil capability.
Simultaneous fire damage to cabling as described above would result in automatic and manual Reactor Trip breaker tripping capability being unavailable from the MCB. Local action is taken at the ROD DRIVE MG SET switchgear and REACTOR TRIP BREAKER switchgear.
This VFDR is associated with the Reactivity Control Function. [OP017, OP115, PH105, PH106, PH117]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

LAC - BUS13 - 480V SWITCHGEAR {Requires Operator Action}
LAC - BUS15 - 480V SWITCHGEAR {Requires Operator Action}
RPS - 52/RTA - REACTOR TRIP BREAKER A {L0618A(L), L0610(LO), L0611(LOC), L0616(LOC), L0617(LOCI)}
RPS - 52/RTB - REACTOR TRIP BREAKER B {L0630(LO), L0638A(LO), L0631(LOC), L0636(LOCI), L0637(LOCI))}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDSCRAM-LCL, consisting of locally tripping the reactor, was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CC-044

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**VFDR**

Fire damage to cabling affects credited KDG01A operability as follows:
(a) Both “A” (L0780, L0365, L0523, or L0530) and “B” (L0782, L0523, or L0530) DG start circuits are impacted preventing automatic DG start, AND fire damage to common power cable (L0365) prevents the DG from being started locally at the ELCP.
(b) Loss of control of DG-A Fuel Oil Day Tank SOV(s) and DG-A Fuel Oil Transfer Pump are postulated due to an impacted common power supply cable (L0365) routed in this fire area. As a consequence, long-term fuel supply to KDG01A is not available challenging availability of the credited DG.
This VFDR is associated with the Vital Auxiliaries Function. [OP016, OP021]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DGS - 5907 - DG A FUEL OIL DAY TANK SOV {L0365(L)}

DGS - 5907A - FOTP A RECIRC SOV {L0365(L)}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0523(LC), L0524(LC), L0530(LCI), L0531(L), L0532(LI), L0536(L), L0537(L), L0554(L), L0560(L), L0780(LC), L0782(LC), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0144, which provides a standby Charging pump in the SB AFW building, were credited to help resolve this VFDR.

**VFDR ID**

VFDR-CC-045

**VFDR**

A MSO concern exists related to excess Feed-water flow to SGs as follows:
(a) With offsite power available, loss of control of MFW Pumps (PFW01A and PFW01B) and downstream MFW valves due to fire damaged cabling, - AND -
(b) Low SG "A" level signal from at least two out of three level transmitter loops (LI-461, LT-462 and/or LT-463) OR low SG "B" level signal from at least two out of three level transmitter loops (LT-471, LT-472 and/or LT-473) due to fire damaged cabling or loss of instrument power
This VFDR is associated with the Decay Heat Removal Function. [OP013]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

IAC - CVTA1 - INSTRUMENT BUS B CONSTANT VOLTAGE XFMR {C0640(P) and Cascading Impact}
IAC - IBPDPCBA - INSTR POWER DISTRIBUTION PANEL A {C2536(P) and Cascading Impact}
IAC - IBPDPCBAR - INSTRUMENT BUS A {C2500(P) and Cascading Impact}
IAC - IBPDPCBB - INSTR POWER DISTRIBUTION PANEL B {C2559(P) and Cascading Impact}
IAC - IBPDPCBBW - INSTRUMENT BUS B {C0640(P), C2503(P) and Cascading Impact}
IAC - IBPDPCBC - INSTR POWER DISTRIBUTION PANEL C {C2583(P) and Cascading Impact}
IAC - IBPDPCBCB - INSTRUMENT BUS C {C2504(P) and Cascading Impact}
IAC - IBPDPCBD - INSTR POWER DISTRIBUTION PANEL D {C2607(P) and Cascading Impact}
IAC - IBPDPCBDY - INSTRUMENT BUS D {C0105(P), C2507(P) and Cascading Impact}
MFW - 3976 - MFW PUMP B DISCHARGE MOV {C0507(LC), C0506(LCI), C0505(LOCI) and Cascading Impact}

**Fire Area ID:** CC - Control Building Complex **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

MFW - 3977 - MFW PUMP A DISCHARGE MOV {C0276(LC), C0275(LCI), C0274(LOCI) and Cascading Impact}
MFW - 3994 - MAIN FW ISOLATION AOV TO S/G B {R4571(LI), R4572(LOI), R4573(LOI), E0212(P), E0216(P) and Cascading Impact}
MFW - 3995 - MAIN FW ISOLATION AOV TO S/G A {R4575(LI), R4576(LOI), R4577(LOI), E0215(P), E0216(P) and Cascading Impact}
MFW - 4269 - MFW FCV TO S/G A {R0760(L), R0778(L), R0779(L), R0780(L), R0781(L), R0782(L), R0784(L), R0785(L), E0215(P), E0216(P) and Cascading Impact}
MFW - 4270 - MFW FCV TO S/G B {R0769(L), R0778(L), R0780(L), R0781(L), R0782(L), R0784(L), R0785(L), E0212(P), E0216(P) and Cascading Impact}
MFW - 4271 - FCV 4269 BYPASS {E0215(P), E0216(P), R0760(L), R0778(L), R0779(L), R0780(L), R0781(L), R0782(L), R0784(L), R0785(L)}
MFW - 4272 - FCV 4270 BYPASS {E0212(P), E0216(P), R0769(L), R0778(L), R0779(L), R0781(L), R0782(L), R0784(L), R0785(L)}
MFW - LI-461 - S/G A LEVEL (NR AT MCB) {R1287(I), R1308(I), R3404(I), R4378(I), R0879(L), R0880(L), R0884(L), R0885(L), C2518(P), C2612(P) and Cascading Impact}
MFW - PFW01A - MFW PUMP A {M0042(LC), M0043(LO), M0160(LO), M0035(LOI), E0025(P) and Cascading Impact}
MFW - PFW01B - MFW PUMP B {M0159(LC), M0043(LO), M0160(LO), M0152(LOI), E0104(P) and Cascading Impact}
RPS - LT-462 - S/G A LEVEL NR XMTR {A0338(I), A0350(I), R0966(I), R0967(I), R0968(I), R0969(I), R0980(I), R1349(I), R4359(I), C2548(P), C2648(P) and Cascading Impact}
RPS - LT-463 - S/G A LEVEL NR XMTR {A0325(I), A0347(I), R1009(I), R1015(I), R1016(I), R1017(I), R1022(I), R1269(I), R4385(I), C2548(P), C2588(P), C2596(P), C2661(P) and Cascading Impact}
RPS - LT-471 - SG-B LEVEL NR XMTR {R1019(I), R1020(I), R1021(I), R1029(I), R1032(I), R1339(I), R4382(I), C2548(P), C2588(P), C2596(P), C2661(P) and Cascading Impact}
RPS - LT-472 - SG-B LEVEL NR XMTR {A0327(I), A0348(I), R0879(I), R0880(I), R0884(I), R0885(I), R1297(I), R3406(I), R4363(I), C2518(P), C2612(P) and Cascading Impact}
RPS - LT-473 - SG-B LEVEL NR XMTR {A0301(I), R0921(I), R0922(I), R0923(I), R0930(I), R0938(I), R4383(I), R4384(I), R4409(I), C2541(P), C2548(P), C2630(P) and Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**Fire Area ID:** CHG - Charging Pump Room, Elevation 235' 6" **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| CHG | 235’-8” Auxiliary Building – Charging Pump Room |

| | | |
|---|---|---|
| **Fire Area ID:** | CHG - Charging Pump Room, Elevation 235' 6" | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train “A” CVCS success path from the RWST to the RCS<br>o Train “A” SIS success path from the RWST to the RCS and the PORV associated with the “A” nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “A”:<br>o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** CHG - Charging Pump Room, Elevation 235' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | o SAFW Pump “C” success path from the SWS or FPS | |
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** CHG - Charging Pump Room, Elevation 235' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • AC Power availability is maintained by train "A" Diesel-Generator and train "A" DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train "A" SWS success path or alignment of alternate cooling from the FPS to the "A" Diesel.<br>• Except for a Control Room fire, train "A" CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Scenario 1: Suppression Effects in CHG of a Fire Originating In CHG:

There are no suppression systems in CHG and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in CHG of a Fire Originating Outside of CHG:

There are no suppression systems in CHG that could be impacted by operation of a fire suppression system or manual firefighting activities outside of CHG.

| | | |
|---|---|---|
| **Fire Area ID:** | CHG - Charging Pump Room, Elevation 235' 6" | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

6" curbs across two doorways leading into the Charging Pump room are installed.

**Fire Area ID:** CHG - Charging Pump Room, Elevation 235' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | S | Modifications: S |
| CHG | 235’-8” Auxiliary Building – Charging Pump Room | None | E, D | None | Detection System, Z01: E D |

**Title** Fire Risk Evaluation for Fire Area CHG

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 1.65E-08

**Δ LERF** Units: [1] 1.82E-11

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The installed fired detection in the fire area is credited in the FPRA to support manual suppression. There is no installed fire suppression in the fire area. Portable extinguishers and hose stations are available in adjacent fire areas and credited in the Fire PRA to support manual suppression in Compartment A1-CHG (charging pump room). No DID enhancements are required. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained** The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and

industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

| | | |
|---|---|---|
| **Fire Area ID:** | CHG - Charging Pump Room, Elevation 235' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-CHG-001

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.
Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 625 and 626). However, this action may not be successful due to the integrity of instrument air piping.
This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH003]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}
RHR - 625 - RHR HX OUTLET 1A {Loss of IA}
RHR - 626 - RHR HX BYPASS {Loss of IA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-CHG-003

**VFDR**

Fire damage to cables routed in this area can spuriously start charging pumps.
Local operator action is required to remove power to the charging pumps.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OMH301, OMH302]

| | | |
|---|---|---|
| **Fire Area ID:** | CHG - Charging Pump Room, Elevation 235' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - PCH01A - CHRG PUMP A {L0400D(LOC), L0399(LOCI), L0400(LOCI)}
CVC - PCH01B - CHRG PUMP B {L0263(LOCI), L0264(LOCI)}
CVC - PCH01C - CHRG PUMP C {L0267(LOCI), L0268(LOCI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CHG-010

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**VFDR**

A MSO concern exists related to letdown failure to isolate and inventory lost to CVCS. In-Parallel letdown isolation valves (AOV-200A, AOV-200B, and AOV-202) are subject to spuriously open, provided instrument air is available. Although in-series letdown isolation valve (AOV-427) can be closed from the MCB with instrument air available, AOV-427 solenoid valve is powered from the non-credited "B" 125V DC electrical train and would eventually fail AOV-427 open upon the depletion of Battery "B" power.
This VFDR is associated with the Inventory and Pressure Control Functions. [OP891]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 200A - LTDN ORIFICE AOV {R0509(LOI)}
CVC – 200B - LTDN ORIFICE AOV {R0502(LOI), Cascading Impact}
CVC - 202 - LTDN ORIFICE AOV {R0503(LOI)}
CVC - 427 - RCS LETDOWN ISOLATION {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| CT | 260'-6" & 260'-10", Cable Tunnel |

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train “A” CVCS success path from the RWST to the RCS<br>o Train “A” SIS success path from the RWST to the RCS and the PORV associated with the “A” nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “A”: | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS<br>o SAFW Pump “C” success path from the SWS or FPS | |
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System.<br>• AC Power availability is maintained by train “A” Diesel-Generator and train “A” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train ”A” SWS success path or alignment of alternate cooling from the FPS to the “A” Diesel.<br>• Except for a Control Room fire, train “A” CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Scenario 1: Suppression Effects in CT of a Fire Originating In CT:

Suppression effects (activation of suppression systems and manual firefighting activities) are not expected to extend beyond the area of fire origin.The deluge system in CT is designed to spray specifically within the Cable Tunnel.

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Scenario 2: Suppression Effects in CT of a Fire Originating Outside of CT:

The Cable Tunnel deluge system is actuated by the associated fire detection system or manual pull boxes in the Auxiliary Building or Intermediate Building which could be vulnerable to a fire originating outside CT if the detection circuits and/or control panel are routed or located outside the fire area (e.g., SSA in the Relay Room).However, this system is designed to spray specifically within the Cable Tunnel and there are no safe shutdown related components within CT (only cables that are not susceptible to water spray), therefore suppression effects are not expected to extend beyond CT.

Similarly, manual firefighting activities outside of CT could potentially spray on and short out an electric manual pull box that could activate the deluge system.However, the system is designed to spray specifically within the Cable Tunnel and there are no safe shutdown related components within CT and suppression effects are not expected to extend beyond CT.

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R, S | Modifications: R S<br>Procedures/Recovery Actions: R |
| CT | 260'-6" & 260'-10", Cable Tunnel | E, R | E, R | E | Combustible Loading Controls: E<br>Detection System, Smoke Detectors for S05: E R<br>Detection System, Z05: E R<br>Water Suppression, S05: E R |

**Title** Fire Risk Evaluation for Fire Area CT

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 4.16E-07

**Δ LERF** Units: [1] 4.57E-09

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

S05, the fire suppression system (automatic deluge) installed in the fire area is credited in the Fire PRA. The installed detection system is credited for DID. Given that the tunnel entrance is sealed with a metal wall and that the emergency exit hatch to the transformer yard is sealed closed, no enhancement to the existing administrative controls is required. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID**

VFDR-CT-001

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.
Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 112B, 112C, PCH01A, 625, 294, and 296). However, this action may not be successful due to the integrity of instrument air piping.
This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH213]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {R0056(LOI), Cascading Impact, Loss of IA}
CVC - 112C - VCT OUTLET AOV {R0056(LC), R0060(LCI), Cascading Impact, Loss of IA}
CVC - 294 - CHRG TO LOOP B CL (AOV) {R0535(LOI), Loss of IA}
CVC - 296 - AUX SPRAY AOV {R0542(LOI), Loss of IA}
CVC - PCH01A - CHRG PUMP A {L0399(LOCI), Cascading Impact, Loss of IA}
LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}
RHR - 625 - RHR HX A OUTLET {R0351(I), Loss of IA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CT-002

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR**

A MSO concern exists related to spurious (ESF) Safety Injection Actuation due to fire damaged cabling. Actuation is possible due to the following separation concerns:
(a) Low PZR pressure signal from at least two out of three PZR pressure transmitters (PT-429, PT-430 and/or PT-431) - OR -
(b) Low PZR pressure signal (as above) AND either a low SG "B" pressure signal (from at least two out of three SG "B" pressure transmitter loops PI-478, PI-479 and/or PT-483) OR a low SG "A" pressure signal (from at least two out of three SG "A" pressure transmitter loops PT-468, PI-469 and/or PT-482) - OR -
(c) High containment pressure signal from at least two out of the three containment pressure transmitter loops (PT-945, PT-947, and/or PT-949) - OR -
(d) Impact to either Train "A" or "B" SI logic circuits
Local action is taken to mitigate spurious SI actuation by opening breakers at DC power panels. However, operator action to 'de-power' circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP004, OP005, OP006, OP015, OP017, OP201, PH202, PH203]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Cascading Impact, Requires Operator Action }
BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Cascading Impact, Requires Operator Action }
BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Cascading Impact, Requires Operator Action }
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Cascading Impact, Requires Operator Action }
ESF - PT-945 - CNMT PRESS XMTR {R0895(I)}
ESF - PT-947 - CNMT PRESS XMTR {R0984(I)}
ESF - PT-949 - CNMT PRESSURE {R0987(I)}
ESF - SI-TRAIN-A - SAFEGUARDS INITIATION TRAIN A {L0354(), L0772(), Cascading Impact}
ESF - SI-TRAIN-B - SAFEGUARDS INITIATION TRAIN B {L0774(), Cascading Impact}
IAC - CVTA1 - INSTRUMENT BUS B CONSTANT VOLTAGE XFMR {C0640(P)}
IAC - IBPDPCBB - INSTR POWER DISTRIBUTION PANEL B {Cascading Impact}
IAC - IBPDPCBBW - INSTRUMENT BUS B {C0640(P)}
MSS - PI-469 - S/G A PRESSURE (MCB) {R0926(I)}
MSS - PI-478 - S/G B PRESSURE (MCB) {R0975(I)}
MSS - PI-479 - S/G B PRESSURE (MCB) {R1024(I)}
MSS - PT-468 - STM GEN A PRESS XMTR {R0886(I)}
MSS - PT-482 - S/G A STM PRESS XMTR {R0978(I), R1285(I)}

| | | |
|---|---|---|
| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

MSS - PT-483 - S/G B STM PRESS XMTR {R0931(I), R1337(I), Cascading Impact}
RPS - PT-429 - PRZR PRESS XMTR {R1101(I), R3408(I), R1091(LI), R1096(LI)}
RPS - PT-430 - PRZR PRESS XMTR {R3973(I), Cascading Impact}
RPS - PT-431 - PRZR PRESS XMTR {R0998(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CT-003

**VFDR**

A MSO concern exists related to inadvertent PORV (430/431C) actuation as follows:
I. PORV opening and spurious operation/failure of block valves
(a) PORVs (430 and 431C) spuriously open--when required closed for HSD--due to fire damage to SOV cables (8616A, 8619A and 8620A for 430; 8616B, 8619B and 8620B for 431C), - AND -
(b) Block valves (515 and 516) fail open or spuriously open after being closed due to cable fire damage
II. PORV opening due to high pressure signal
(a) High PZR pressure signal from PT-429 and a high PZR signal from either channel 2 (PT-430) or channel 3 (PT-431) actuates 430, - OR -
(b) High PZR pressure signal from PT-431 and a high PZR signal from either channel 1 (PT-429) or channel 4 (PT-449) actuates 431C, - OR -
(c) High PZR pressure signal from at least two out of the three transmitters (PT-450, PT-451 and/or PT-452) actuates BOTH 430 and 431C
Local actions are taken to mitigate spurious operation as follows:
(a) Open breakers at DC power panel. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit. - AND -
(b) Isolate IA to Containment causing the valves to fail closed. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, OE010, OP007, OP008, OP009, OP011, OP017, PH202, PH203, PH217]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Cascading Impact, Requires Operator Action }
BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Cascading Impact, Requires Operator Action }
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Cascading Impact, Requires Operator Action }
IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}
IAS - 8619A - N2 ARMING SOV FOR PORV 430 {SAC0211A(LO), SAC0211B(LO), Cascading Impact}
IAS - 8619B - N2 ARMING SOV FOR PORV 431C {SAC0212A(LO), SAC0212B(LO), Cascading Impact}
IAS - 8620A - PORV 430 ACTUATION SOV {R0275(LO), Cascading Impact}
IAS - 8620B - PORV 431C ACTUATION SOV {R0275(LO), Cascading Impact}
NAS - 8616A - ACCUM TO SURGE TANK SOV FOR PORV 430 {SAC0213(LO)}
NAS - 8616B - ACCUM TO SURGE TANK SOV FOR PORV 431C {SAC0214(LO)}
RCS - 430 - PORV (AOV) {SAC0211A(LO), SAC0211B(LO), R0275(LOI), Cascading Impact}
RCS - 431C - PORV (AOV) {SAC0212A(LO), SAC0212B(LO), R0275(LOI), Cascading Impact}
RCS - 515 - PORV BLOCK VALVE (MOV) FOR 431C {C1060(LOCI), Cascading Impact}
RCS - 516 - PORV BLOCK VALVE (MOV) FOR 430 {C0694(LOCI), Cascading Impact}
RPS - PT-429 - PRZR PRESS XMTR {R1101(I), R3408(I), R1091(LI), R1096(LI)}
RPS - PT-430 - PRZR PRESS XMTR {R3973(I)}
RPS - PT-431 - PRZR PRESS XMTR {R0998(I)}
RPS - PT-449 - PRZR PRESS XMTR {R1038(I), R1101(I), R1104(I), R1091(LI), R1096(LI)}
RPS - PT-450 - RC OVERPRESS PROTECTION XMTR {SAI0106(I)}
RPS - PT-451 - RC OVERPRESS PROTECTION {SAI0107(I)}
RPS - PT-452 - RC OVERPRESS PROTECTION {SAI0108(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-CT-004

**VFDR**

A MSO concern exists related to RWST drain down via Containment Spray actuation. Actuation is possible due to the following separation concerns:
(a) High containment pressure signal from at least two out of three containment pressure transmitters (PT-946, PT-948 and/or PT-950) AND high

containment pressure signal from at least two out of three containment pressure transmitters (PT-945, PT-947 and/or PT-949) - OR -
(b) Train "A" Pump (PSI02A) spurious starts and at least one discharge valve (860A or 860B) spuriously opens, OR Train "B" Pump (PSI02B) spurious starts and at least one discharge valve (860C or 860D) spuriously opens
This VFDR is associated with the Inventory and Pressure Control Functions. [OP003, OP017, OP209, OP211]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CSS - 860A - CS PUMP A DISCHARGE {C0756(LOCI), Cascading Impact}
CSS - 860B - CS PUMP A DISCHARGE {C1122(LOCI), Cascading Impact}
CSS - 860C - CS PUMP B DISCHARGE {C0819(LOCI), Cascading Impact}
CSS - 860D - CS PUMP B DISCHARGE {C1182(LOCI), Cascading Impact}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A {L0337(LOCI), Cascading Impact}
CSS - PSI02B - CONTAINMENT SPRAY PUMP B {L0215(LOCI), Cascading Impact}
ESF - PT-945 - CNMT PRESS XMTR {R0895(I)}
ESF - PT-946 - CNMT PRESS XMTR {R0937(I)}
ESF - PT-947 - CNMT PRESS XMTR {R0984(I)}
ESF - PT-948 - CNMT PRESS XMTR {R0940(I)}
ESF - PT-949 - CNMT PRESSURE {R0987(I)}
ESF - PT-950 - PRESSURE TRANSMITTER CONTAINMENT PRESSURE INSTRUMENT LOOP 95 {R1030(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID** VFDR-CT-005

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**VFDR**

A MSO concern exists related to inadvertent RCS pressure decrease. The scenario is postulated due to the following separation concerns:
(a) Failure of PZR Heaters (EHTRRC01A, EHTRRC02A, EHTRRC01B, and EHTRRC02B), - AND -
(b) Inability to trip and/or spurious start of at least one RCP (PRC01A and/or PRC01B) with spurious opening of PZR Spray valves (AOV-431A and AOV-431B), - AND -

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

(c) Inability to trip and/or spurious start of at least one CHG Pump (PCH01A, PCH01B, and/or PCH01C) with spurious opening of Auxiliary Spray valve (AOV-296)
Local actions are taken to mitigate spurious operation as follows:
(a) Open breakers at DC power panel. However, operator action to "de-power" circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit. - AND -
(b) Isolate IA to Containment causing the valves to fail closed. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented. - AND -
(c) Stop the RCPs (see VFDR-CT-017) - AND -
(d) Stop the CHG Pumps (see VFDR-CT-018 and VFDR-CT-028)
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, OE010, OP017, OP204, PH202, PH203, PH217]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Cascading Impact}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Cascading Impact}
CVC - 296 - AUX SPRAY AOV {R0542(LOI)}
CVC - PCH01A - CHRG PUMP A {L0399(LOCI), Cascading Impact}
CVC - PCH01B - CHRG PUMP B {L0263(LOCI), Cascading Impact}
CVC - PCH01C - CHRG PUMP C {L0267(LOCI), Cascading Impact}
IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}
RCS - 431A - PZR SPRAY VALVE (AOV) {R1091(LOC), Cascading Impact}
RCS - 431B - PZR SPRAY VALVE (AOV) {R1096(LOC), Cascading Impact}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), Cascading Impact}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI), Cascading Impact}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), Cascading Impact}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI), Cascading Impact}
RCS - PRC01A - RCP A {C1281(L), M0050(LC), M0045(P)}
RCS - PRC01B - RCP B {M0145(LC), M0140(P)}

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

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| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action CVHFDCHGTRIPFIRE, consisting of locally securing the charging pumps, is credited. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-CT-006 |
| **VFDR** | A MSO concern exists related to CHG pump damage. Fire damage to cables (R0056 and/or R0060) can spuriously close VCT outlet valve (AOV-112C) AND/OR RWST outlet valve (AOV-112B) can fail closed on a loss of power to Train "B" with the credited charging pump in service. This would result in a loss of CHG pump suction source. The capability to stop any running CHG Pump (PCH01A, PCH01B, PCH01C) from the MCB would not be available due to fire damaged cables (L0399, L0263, L0267; respectively). In particular, a hot short or short to ground affecting Cable L0399 could cause Breaker 52/CHP1A to close, leading to the spurious operation of Charging Pump PCH01A. Similarly, Breaker 52/CHP1B could spuriously close due to a hot short or short to ground affecting Cable L0263. Breaker 52/CHP1C could spuriously close due to a hot short or short to ground affecting Cable L0267. An uncontrolled charging flow from any of the charging pumps challenges the reactor pressure and inventory control nuclear safety performance criterion (MSO 21).This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OP210]This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | CVC - 112B - RWST TO CHARGING PUMP SUCTION {R0056(LOI), Cascading Impact, Loss of IA}<br>CVC - 112C - VCT OUTLET AOV {R0056(LC), R0060(LCI), Cascading Impact, Loss of IA}<br>CVC - PCH01A - CHRG PUMP A {L0399(LOCI), Cascading Impact}<br>CVC - PCH01B - CHRG PUMP B {L0263(LOCI), Cascading Impact}<br>CVC - PCH01C - CHRG PUMP C {L0267(LOCI), Cascading Impact} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions RCHFDMAKEUP, consisting of locally aligning and starting the new charging system and CVHFDCHGTRIPFIRE, consisting of locally securing the charging pumps, were credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR. |
| **VFDR ID** | VFDR-CT-007 |

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

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| **VFDR** | Operator action is taken to close Instrument Air Containment Manual Isolation Valve (V-5397) to isolate Instrument Air to Containment. However, this action may not be successful to prevent spurious operation of AOVs in the Containment as the instrument air header is not vented.<br>This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, PH217]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue. |
| **Component(s)** | IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-CT-008 |
| **VFDR** | 3-Phase proper phase rotation shorts must be considered for high/low pressure interface in-series valves MOV-700 and MOV-701 since power cabling for the valves is routed through this area. Reliance on de-powering to prevent spurious opening requires assurance that no three-phase cabling of the same or higher voltage is routed in the same raceway between the MCC and the valve. Spurious operation of these valves results in a high/low pressure system interface concern. Additionally; an IN 92-18 concern exists, as identified in DA-EE-2000-066 – Attachment G.<br>This VFDR is associated with the Inventory and Pressure Control Functions, and Decay Heat Removal Function. [OP001, OP002, OP017]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | RHR - 700 - RHR PUMP SUCTION FROM RCS MOV {C0722(LOCI), C0724(LOCI), C0720(P)}<br>RHR - 701 - RHR PUMP SUCTION FROM RCS {C1089(LOCI), C1091(LOCI), C1087(P)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the consideration that 3-phase proper polarity hot short are implausible. No recovery action was credited to resolve this VFDR. |
| **VFDR ID** | VFDR-CT-011 |

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

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**VFDR**

A MSO concern exists related to spurious DG start without SW cooling. Credited KDG01A can spuriously start due to cable fire damage (L0780 and/or L0782). Concurrent fire damage to cables (L0483 and L0487) can trip credited SW Pumps (PSW01A and PSW01C). This results in KDG01A running without cooling water.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP206]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0780(LC), L0782(LC)}
SWS - PSW01A - SERVICE WATER PUMP A {L0483(LOCI)}
SWS - PSW01C - SERVICE WATER PUMP C {L0487(LOCI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No Recovery Action was credited to resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CT-012

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**VFDR**

A MSO concern exists related to the loss of power to BUS14 as follows:
(a) With offsite power available and KDG01A idle, breaker 52/EG1A1 can spuriously close due to fire damage to cable L0319. This results in a KDG01A reverse power trip signal to 52/EG1A1. A concurrent spurious trip of breaker 52/14 (fire damaged cable L0315) then results in loss of all AC power to BUS14. - OR -
(b) With offsite power available and KDG01A spuriously starting (cables L0780 or L0782), 52/EG1A1 can spuriously close (cable L0319) on an already energized BUS14. This result in both 52/EG1A and 52/14 tripping on an overcurrent signal, causing a loss of power to BUS14.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP205]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0319(LOCI)}

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| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0780(LC), L0782(LC)}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0315(LOCI), M0094(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CT-013

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**VFDR**

Fire damage to cable (C5618) results in loss of power to MCCN, which in turn impacts credited Train “A” CREATS components. Since the redundant Train "B" components are also considered unavailable (deterministic assumption), a loss of the Safe Shutdown Support function for MCR habitability and MCR equipment operability is postulated.
This VFDR is associated with the Vital Auxiliaries Function. [OP212]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CBV - AKA05A - CREATS HEATER A {Cascading Impact}
CBV - AKF10A - CREATS TRAIN A FAN {Cascading Impact}
CBV - AKP07A - CREATS COOLING SYSTEM TRAIN A {Cascading Impact}
LAC - ACPDPCB11 - CREATS LIGHTING PANEL A {Cascading Impact}
LAC - MCCN - MOTOR CONTROL CENTER N {C5618(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

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|---|---|
| **VFDR ID** | VFDR-CT-017 |
| **VFDR** | If offsite power is available, cable fire damage can prevent tripping one or both RCPs (PRC01A and/or PRC01B) from the MCB. The pumps continuing to run will have an adverse impact on controlling RCS cool down rate.<br>Local action is taken at the 4KV Buses to trip both pumps.<br>This VFDR is associated with the Decay Heat Removal Function. [OP017, PH206, PH207]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue. |
| **Component(s)** | RCS - PRC01A - RCP A {C1281(L), M0050(LC)}<br>RCS - PRC01B - RCP B {M0145(LC)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-CT-018 |
| **VFDR** | A MSO concern exists related to loss of BUS14 and BUS18. The scenario is postulated due to the following separation concerns:<br>(a) Loss of control of KDG01A (cables L0780 and L0782) can prevent MCB action to start DG and spurious opening of 52/18 (cable L0206) if offsite power is available, results in a loss of power to credited BUS18<br>(b) Spurious opening or failure to close of breaker 52/EG1A1 (cable L0319) and spurious opening of 52/14 (cable L0315) if offsite power is available, results in a loss of power to credited BUS14<br>Local action is taken to control KDG01A, strip the loads off BUS14/BUS18, start KDG01A, start SW Pumps (BUS18) and load BUS14.<br>This VFDR is associated with the Vital Auxiliaries Function. [OP017, PH210, PH211, PH214, PH221, PH227]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue. |
| **Component(s)** | ABV - AAF04 - AUXILIARY BUILDING EXHAUST FAN G {G0488A(LC), G0490A(LOI), G0947(LO), L0732(LO), Cascading Impact} |

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

AFW - PAF01A - AUXILIARY FEEDWATER PUMP A {L0371(P), L0372(LOCI), L0373(LOCI), L0374(L)}
AFW - PSF01A - SAFW PUMP C {FWL0010(LI), L0744(LO), Cascading Impact}
CCW - PAC02A - CCW PUMP A {L0395(LOCI), Cascading Impact}
CSS - PSI02A - CONTAINMENT SPRAY PUMP A {L0337(LOCI), Cascading Impact}
CVC - PCH01A - CHRG PUMP A {L0399 (LOCI), Cascading Impact}
EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {L0319(LOCI), Cascading Impact}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {Requires Operator Action}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0780(LC), L0782(LC), Requires Operator Action}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0315 (LOCI), M0094(P)}
LAC - 52/18 - SPT SUPPLY BREAKER TO BUS 18 {L0206(LO), Requires Operator Action}
LAC - 52/BT14-13 - BKR FOR BUS14 TO BUS13 TIE {L0328(P), L0329(LOCI), Cascading Impact}
LAC - 52/IH1A - BREAKER FOR EHTRCW01A (CIRCULATING WATER INTAKE HEATER A) {Requires Operator Action}
LAC - 52/IH1C - BREAKER FOR EHTRCW01C (CIRCULATING WATER INTAKE HEATER C) {Requires Operator Action}
LAC - BUS14 - 480V SWITCHGEAR {L0315 (LOCI), L0319(LOCI), L0328(P), L0329(LOCI), L0776(LO), M0094(P), Cascading Impact, Requires Operator Action}
LAC - BUS18 - 480V SWITCHGEAR {L0206(LO) {Requires Operator Action}
LAC - MCCC - MOTOR CONTROL CENTER C {L0391(LOCI), Requires Operator Action}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), Cascading Impact}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {L0381(LOCI), R1101(OC), Cascading Impact}
RCV - ACF08A - CONTAINMENT RECIRCULATING FAN A {L0352(LOCI) L0353(LOCI), Cascading Impact}
RCV - ACF08D - CONTAINMENT RECIRCULATING FAN D {L0363(LOCI), L0364(LOCI), Cascading Impact}
RHR - PAC01A - RHR PUMP A {L0378(LOCI), Cascading Impact}
SIS - PSI01A - SI PUMP A {L0333(LOCI), Cascading Impact}
SIS - PSI01C - SI PUMP C {L0210(LOCI), L0325(LOCI), Cascading Impact}
SWS - PSW01A - SERVICE WATER PUMP A {L0483(LOCI), Requires Operator Action}
SWS - PSW01C - SERVICE WATER PUMP C {L0487(LOCI), Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

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| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-CT-019

**VFDR**

Sampling system isolation valves may spuriously open due to cable fire damage resulting in a potential minor RCS inventory loss.
Local action is taken to de-energize the Nuclear Sample Panel (NSP) at DC panel DCPDPTB01B. However, operator action to 'de-power' circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, PH212]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC – DCPDPTB01B - TURBINE BLDG DC DISTRIBUTION PANEL {Requires Operator Action}
LAC - NSP - NUCLEAR SAMPLING PANEL {Requires Operator Action}
PSS - 966A - PZR STEAM SAMPLE AOV {R03171(LOI), Requires Operator Action}
PSS - 966B - PZR LIQUID SAMPLE AOV {R03171(LOI), Requires Operator Action}
PSS - 966C - LOOP B HL SAMPLE {R3163(LOI), Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-CT-020

**VFDR**

A MSO concern exists related to inadvertent steam dumping as follows:
(a) If Instrument Air is available, cable fire damage can prevent one or both MSIVs from closing - AND -
(b) Downstream steam loads, MSS valves to moisture separator reheaters (3425, 3425A, 3426, 3426A, 3427, 3427A, 3428, and 3428A), can fail open on loss of power
Local action is taken to fail both MSIVs closed by isolating the instrument air supply and venting the downstream instrument air header to each MSIV.
This VFDR is associated with the Decay Heat Removal Function. [OP214, PH215]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

IAS - 5408A - IA ISOL VALVE to AOV-3517, A MSIV {Requires Operator Action}
IAS - 5409B - IA ISOL VALVE TO S/G B MSIV {Requires Operator Action}
IAS - 5471 - A MSIV EMERG VENT {Requires Operator Action}
IAS - 5472 - B MSIV EMERG VENT {Requires Operator Action}
IAS - 5473 - A MSIV EMERG VENT {Requires Operator Action}
IAS - 5474 - B MSIV EMERG VENT {Requires Operator Action}
LAC - ACPDPCB03 - CONTROL BUILDING 120/208V DISTRIBUTION PANEL B1 {Cascading Impact}
LAC - ACPDPTB07 - TURBINE BUILDING MISCELLANEOUS 120V DISTRIBUTION PANEL A {Cascading Impact}
LAC - ACPDPTB10 - TURBINE BUILDING MISCELLANEOUS 120V DISTRIBUTION PANEL B {Cascading Impact}
MSS - 3425 - MAIN STEAM CONTROL AOV TO MSR 1A {Cascading Impact}
MSS - 3425A - MOISTURE SEPARATOR REHEATER 1A MINI WARMUP AIR OPERATED VALV {Cascading Impact}
MSS - 3426 - MAIN STEAM CONTROL AOV TO MSR 1B {Cascading Impact}
MSS - 3426A - MSR 1B MINI WARM-UP AOV {Cascading Impact}
MSS - 3427 - MAIN STEAM CONTROL AOV TO MSR 2A {Cascading Impact}
MSS - 3427A - MSR 2A MINI WARMUP AOV {Cascading Impact}
MSS - 3428 - MAIN STEAM CONTROL AOV TO MSR 2B {Cascading Impact}
MSS - 3428A - MSR 2B MINI WARMUP AOV {Cascading Impact}
MSS - 3516 - MSIV B {G1180(L), G1181(LC), G1197(LI), G1198(LC), Requires Operator Action}
MSS - 3517 - MSIV A {G1186(L), G1187(LC), G1191(LI), G1192(LC), Requires Operator Action}

**Disposition** Modification ESR-12-0128, which ensures automatic MSIV closure, deterministically resolves this VFDR.

**VFDR ID** VFDR-CT-021

**VFDR** Loss of control of the TDAFW Pump from the MCB is postulated in this fire area. Cable damage can prevent the TDAFW Pump from supplying SG “A” adversely impacting the ability to effectively remove decay heat.
Local action is taken to transfer TDAFW Pump controls and establish flow to SG “A” from the IBELIP.
This VFDR is associated with the Decay Heat Removal Function. [PH218, PH220]

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - 3996 - TDAFWP DISCHARGE MOV {E0093(L), E0097(LOCI), Requires Operator Action}
AFW - PAF03 - TURBINE DRIVEN AUXILIARY FEEDWATER PUMP {Requires Operator Action}
AFW - PLO11 - TDAFWP DC LUBE OIL PUMP {E0193(LCI), Requires Operator Action}
IAC - IBELIP - INTERMEDIATE BLDG EMERG LOCAL INSTR PANEL {Requires Operator Action}
MSS - 3505A - SG A TO TDAFWP: {E0036(LOCI), E0032(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW syste once the inital water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump, were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

**VFDR ID** VFDR-CT-022

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**VFDR**

Both CST level indicators (LI-2022A and LI-2022B) at the MCB are impacted due to fire damaged cable.
Local action is taken to monitor CST level at PI-2808.
This VFDR is associated with the Decay Heat Removal Function. [OP208, PH219]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CND - LI-2022A - CDST A LEVEL {G0339(I), R3520(I)}
CND - LI-2022B - CDST B LEVEL {R3521(I)}
CND - PI-2808 - CST LOCAL LEVEL INDICATOR {Requires Operator Action}

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|---|---|---|
| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

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| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system, was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-CT-023 |
| **VFDR** | Fire damage (line to ground fault or open circuit) to cable L0684 simulates an under-voltage signal which will strip BUS14 loads.<br>Local action is taken to disable circuitry at the UNDERVOLTAGE RELAY CABINET by removing DC fuse blocks FUARA1RC 14/2-P and FUARA1RC 14/3-N for BUS14.<br>This VFDR is associated with the Vital Auxiliaries Function. [PH222]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue. |
| **Component(s)** | LAC - UVBUS14 - BUS 14 UV CIRCUITRY {E0274B(), L0312(), L0681(), L0684(), L0686(), L0687(), L0688(), L0689(), L0876A(), Requires Operator Action} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100k W diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-CT-024 |
| **VFDR** | Containment sump MOVs (850A and 850B) are subject to spurious opening. MOV-856 is required to be closed to prevent RWST drain down to the sump during HSD. Fire damage to cable C0790 can spuriously open 856, bypassing the control power key switch (1/856-KS on MCB).<br>Local action is taken to open the breaker for 856 at MCCC AND locally closing the valve.<br>This VFDR is associated with the Inventory and Pressure Control Functions. [OP010, OP017, OMH001, PH224] |

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| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

LAC - MCCC - MOTOR CONTROL CENTER C {Requires Operator Action}
RHR - 850A - CNMT SUMP TO RHR PUMP MOV {C0704(LOCI)}
RHR - 850B - CNMT SUMP TO RHR PUMP MOV {C1070(LOCI)}
RHR - 856 - RWST TO RHR MOV {C0791(L), C0790(LOCI), Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CT-025

**VFDR**

CHG Pump FCV-142 is subject to spurious closure due to a hot short to cable R0150. This would adversely impact RCS makeup and reactivity control.
Local action is taken to open bypass valve 384C.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [PH225]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 142 - CHRG FCV {R0150(LOC)}
CVC - 384C - AOV 142 BYP VLV {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

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|---|---|---|
| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-CT-026

**VFDR**

MOV-313 is subject to spurious opening (fire damage to cable C0872) which could result in a loss of charging capability. The VCT can fill with high temperature water from RCP seal leakoff, via the Seal Water HX without CCW cooling, flashing steam in the VCT and causing VCT pressure to rise above head pressure of the RWST. When the CHG Pump is restarted, this results in the pump drawing suction from the VCT (instead of the RWST), introducing saturated water and; thereby, damaging the credited CHG pump.
Local action is taken to close manual valves V-315A and V-315C to isolate RCP seal return to the VCT.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [PH226]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 313 - SEAL OR EXCESS LETDOWN RETURN ISOLATION MOV {C0872(LOCI), C0873(LI)}
CVC - 315A - INLET BLOCK VALVE TO SEAL RETURN FILTER {Requires Operator Action}
CVC - 315C - SEAL RETURN FILTER BYPASS VLV {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID** VFDR-CT-027

**VFDR**

Cable fire damage (L0399) can prevent operating credited CHG pump PCH01A from the MCB.
Local action is taken to (i) align RWST suction source by opening manual valve 358, (ii) close manual valve 289 to isolate RCP seal injection, (iii) isolate VCT cover gas (close 261 and 262), and (iv) control PCH01A locally from the ABELIP.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [PH228, PH229]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

CVC - 261 - VCT H2 INLT MANUAL BLK VLV {Requires Operator Action}
CVC - 262 - VCT NITROGEN INLET MANUAL BLK VLV {Requires Operator Action}
CVC - 289 - CHARGING PUMPS DISCHARGE ISOL VLV TO RCP SEAL INJECTION {Requires Operator Action}
CVC - 358 - RWST MAKEUP AOV BYPASS VALVE {Requires Operator Action}
CVC - PCH01A - CHRG PUMP A {L0399(LOCI), Requires Operator Action}
IAC - ABELIP - AUX BLDG EMERG LOCAL INSTR PANEL {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID** VFDR-CT-028

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**VFDR**

If offsite power is available or non-credited KDG01B starts and connects to BUS16, various loads on the non-credited bus may spuriously start challenging a controlled shutdown of the plant.
Local action is taken to remove all Supply, Bus Tie, and Load Breaker 125V DC fuses -AND- open all 480V AC breakers at BUS16 to isolate BUS16.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, PH230]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - PAF01B - AUXILIARY FEEDWATER PUMP B {L0253(L), L0373(LO), L0251(LOCI), L0252(LOCI), L0250(P)}
AFW - PSF01B - SAFW PUMP D {FWL0028(LI), L0723(LO), Cascading Impact}
CCW - PAC02B - CCW PUMP B {L0282(LOCI), Cascading Impact}
CSS - PSI02B - CONTAINMENT SPRAY PUMP B {L0215(LOCI), Cascading Impact}
CVC - PCH01B - CHRG PUMP B {L0263(LOCI), Cascading Impact}
CVC - PCH01C - CHRG PUMP C {L0267(LOCI)}
EAC - 52/EG1B1 - EDG B SUPPLY TO BUS 16 {L0189(LOCI), Cascading Impact, Requires Operator Action}
LAC - 52/16 - SPT SUPPLY BREAKER TO BUS 16 {L0184(LOCI), M0103(P), Requires Operator Action}
LAC - 52/BT16-14 - BREAKER FOR BUS 16 TO BUS 14 TIE {L0206(LC), L0204(LOCI), Requires Operator Action}

| | | |
|---|---|---|
| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

LAC - 52/BT16-15 - BREAKER FOR BUS 16 TO BUS 15 TIE {L0198(LOCI), L0197(P), Cascading Impact, Requires Operator Action}
LAC - MCCD - MOTOR CONTROL CENTER D {L0289(LOC), Requires Operator Action}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI), Cascading Impact}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {L0276(LOCI), L0277(LOCI), Cascading Impact}
RCV - ACF08B - CONTAINMENT RECIRCULATING FAN B {L0224(LOCI), L0225(LOCI), Cascading Impact}
RCV - ACF08C - CONTAINMENT RECIRCULATING FAN C {L0239(LOCI), L0240(LOCI), Cascading Impact}
RHR - PAC01B - RHR PUMP B {L0259(LOCI), Cascading Impact}
SFP - PAC07B - SPENT FUEL POOL RECIRCULATING PUMP B {L0719(LO), Cascading Impact}
SIS - PSI01B - SI PUMP B {L0194(LOCI), Cascading Impact}
SIS - PSI01C - SI PUMP C {L0210(LOCI), L0325(LOCI), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-CT-030

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**VFDR**

Credited TDAFW Pump suction cannot be aligned to SW from the MCB due to cable damage or a loss of AC power to Train “B” MOV-4013 and normally closed in-series valve 4098 (normal CST re-fill capability is not credited). In addition, suction line drain valve 4358D is normally open.
Local action is taken to align SW to the TDAFW Pump suction when CST level indicates less than 5 feet on local level indicator PI-2808.
This VFDR is associated with the Decay Heat Removal Function. [OP017, PH233, PH234]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - 4098 - TDAFWP SUCTION FROM SWS MANUAL IV {Requires Operator Action}
AFW - 4358D - TDAFW PUMP SW SUCTION LINE TELLTALE ISOL VLV {Requires Operator Action}
CND - PI-2808 - CST LOCAL LEVEL INDICATOR {Requires Operator Action}
LAC - MCCD - MOTOR CONTROL CENTER D {L0289(LOC), Requires Operator Action}
SWS - 4013 - TDAFWP SW SUCTION MOV {C1215(LI), C1216(LOCI), Requires Operator Action}

| | | |
|---|---|---|
| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the inital water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump, were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

**VFDR ID**

VFDR-CT-031

**VFDR**

Loss of control of AFW flow from the MCB is postulated in this fire area. TDAFWP flow control valves (4297 and 4298) to both SGs are administratively maintained open. If non-credited Train “B” power is available, TDAFW pump discharge valve MOV-3996 may spuriously close due to cable fire damage. Local action is taken to close 4298 block valve (4002) to isolate TDAFW flow to SG “B” and locally operate MOV-3996 to control TDAFW flow to SG “A”. However, local action to reposition 3996 is considered to be unsuccessful due to IN 92-18 concerns ("Hot Short Damaged" due to spurious operation as identified in DA-EE-2000-066 - Attachment G).

This VFDR is associated with the Decay Heat Removal Function. [OP001, PH236]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - 3996 - TDAFWP DISCHARGE MOV {E0093(L), E0097(LOCI), Requires Operator Action}

AFW - 4002 - AOV-4298 OUTLET BLOCK VALVE {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the inital water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump, were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

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| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-CT-033

**VFDR**

"A" Battery Charger (BYCA1) is postulated to be unavailable due to fire damaged cable (C5191) and "B" Battery Charger (BYCB1) is postulated to be unavailable due to a loss of cascading power from the non-credited train "B" 480V AC system. A long term power supply to the following components is required in support of achieving safe and stable conditions:

(a) ABELIP and DG "A" Fuel Oil Transfer Pump (PDG02A), by aligning DCPDPCB02A

(b) IBELIP and TDAFW Pump DC LUBE OIL Pump (PLO11), by aligning DCPDPCB02B

Local action is taken to align the TSC DC supply to provide power for long term operation of both "A" and "B" Battery Buses.

This VFDR is associated with the Vital Auxiliaries Function. [OP017, PH237, PH238]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - PLO11 - TDAFWP DC LUBE OIL PUMP {E0193(LCI)}
BDC - BYCA1 - BATTERY CHARGER A1 {C5191(P)}
BDC - BYCB1 - BATTERY CHARGER B1 {Cascading Impact}
BDC - DCPDPCB01A - BATTERY A MAIN DISCONNECT {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB01B - BATTERY B MAIN DISCONNECT {Cascading Impact, Requires Operator Action }
BDC - DCPDPCB02A - BATTERY A MAIN FUSE CABINET {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB02B - BATTERY B MAIN FUSE CABINET {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB05A - TSC BATTERY A FUSED DISCONNECT {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB05B - TSC BATTERY B FUSED DISCONNECT {Cascading Impact, Requires Operator Action}
BDC - DCPDPCD01 - TSC BATTERY A & B FUSED DISCONNECT {Cascading Impact, Requires Operator Action}
BDC - DCPDPTB02 - TSC TO BATTERY A & B THROWOVER SWITCH {Cascading Impact, Requires Operator Action}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
IAC - ABELIP - AUX BLDG EMERG LOCAL INSTR PANEL {Cascading Impact}
IAC - IBELIP - INTERMEDIATE BLDG EMERG LOCAL INSTR PANEL {Cascading Impact}
LAC - 52/15 - BKR FOR BUS 15 SUPPLY {L0198(LC), Requires Operator Action}
LAC - 52/BT16-15 - BREAKER FOR BUS 16 TO BUS 15 TIE {L0198(LOCI), L0197(P), Requires Operator Action}
LAC - BUS15 - 480V SWITCHGEAR {L0198(LOC), L0024(P), L0079(P), L0197(P), Requires Operator Action}
LAC - BUS16 - 480V SWITCHGEAR {L0206(LC), L0777(LO), L0184(LOCI), L0189(LOCI), L0198(LOCI), L0204(LOCI), Requires Operator Action}

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

LAC - BYCTSC - TSC BATTERY CHARGER {Cascading Impact, Requires Operator Action}
LAC - KED03 - TSC EMERGENCY DIESEL-GENERATOR {Cascading Impact, Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions DCHFDTSCLT and FSHFDTSCLT-DR, respectively consisting of aligning the TSC diesel generator and the TSC battery charger, were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-CT-039

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**VFDR**

Instrument Air to the CNMT is isolated (via 5397) by an unrelated operator action to mitigate spurious operation of AOVs inside CNMT. With Instrument Air isolated, and cable fire damage (R0542), credited Aux. Spray valve AOV-296 cannot be controlled from the MCB. Also see VFDR-CT-038 for IN 92-18 issue associated with credited PORV block valve (MOV-516) operation.
Local action is taken to operate AOVs 294 and 296 for RCS pressure control during cooldown by:
(a) Aligning the Service Air System to supply Instrument Air in the CNMT
(b) Installing a Switch Adapter to control AOVs 294 and 296 from the Aux. Bldg. Mezzanine
This VFDR is associated with the Vital Auxiliaries Function. [PC208, PC209, PC210]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

CVC - 294 - CHRG TO LOOP B CL (AOV) {R0535(LOI)}
CVC - 296 - AUX SPRAY AOV {R0542(LOI)}
PSA - 7141 - SA MIDDLE ISOL VLV TO CONTAINMENT (INTER BLDG) {Requires Operator Action}
PSA - 7222 - SA OUTER ISOL VLV TO CONTAINMENT (INTER BLDG) {Requires Operator Action}
PSA - 7227 - SA ISOL VLV (IN CNMT) {Requires Operator Action}
PSA - 7227A - SA TO IA CROSSTIE ISOLATION VALVE INSIDE CONTAINMENT {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

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| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-CT-047

**VFDR**

A MSO concern exists related to the inability to trip the Reactor from the MCB. Fire damaged cabling would result in Reactor Trip capability function being unavailable as follows:
(a) 52/RTA: A line-ground fault (to cable L0611 or E0224) would result in the loss of Trip Coil capability AND a hot short (to cable L0610) would result in the loss of UV Trip Coil capability - AND -
(b) 52/RTB: A line-ground fault (to cable L0631 or E0233) would result in the loss of Trip Coil capability AND a hot short (to cable L0630) would result in the loss of UV Trip Coil capability -AND -
(c) Fire damage to cables for breakers 52/13 and 52/15 prevents isolating BUS13 and BUS15 and consequently de-energizing both ROD DRIVE MG SETs. Local action is taken at the switchgear to trip both ROD DRIVE MG SETs.
This VFDR is associated with the Reactivity Control Function. [OP017, OP213, PH204, PH205, PH216]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre transition OMA and a separation issue.

**Component(s)**

LAC - 52/13 - BKR FOR BUS13 SUPPLY {L0329(LC), Cascading Impact}
LAC - 52/15 - BKR FOR BUS 15 SUPPLY {L0198(LC), Cascading Impact}
LAC - BUS13 - 480V SWITCHGEAR {Requires Operator Action}
LAC - BUS15 - 480V SWITCHGEAR {Requires Operator Action}
RPS - 52/RTA - REACTOR TRIP BREAKER A {L0610(LO), L0611(LOC), E0224(P)}
RPS - 52/RTB - REACTOR TRIP BREAKER B {L0630(LO), L0631(LOC), E0233(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDSCRAM-LCL, consisting of locally tripping the reactor, was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-CT-048

**VFDR**

Fire damage to cables (E0036 and E0112) results in spurious operation of both SG MOVs (3504A and 3505A) to the TDAFW Pump. These valves can spuriously close when required open adversely impacting the ability to remove decay heat.

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| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

Local action is taken to de-energize the valve circuits at DCPDPCB03A and DCPDPCB03B. Local action to reposition the MOV is considered unsuccessful due to IN 92-18 concerns ("Hot Short Damaged" due to spurious operation as identified in DA-EE-2000-066 - Attachment G).
This VFDR is associated with the Decay Heat Removal Function. [OP001, OP017, PH202, PH203]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Cascading Impact, Requires Operator Action}
BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Cascading Impact, Requires Operator Action}
MSS - 3504A - SG B TO TDAFWP: {E0112(LOCI), E0108(P), Cascading Impact}
MSS - 3505A - SG A TO TDAFWP: {E0036(LOCI), E0032(P), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the inital water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump, were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR.

**VFDR ID**

VFDR-CT-049

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**VFDR**

Fire damage to cabling affects credited KDG01A operability as follows:
(a) Fire damage to cables associated with credited DG can prevent KDG01A from starting. Both “A” (L0780 or L0365) and “B” (L0782) DG start circuits are impacted preventing automatic DG start, AND fire damage to common power cable (L0365) prevents DG from being started locally at the DGAELCP.
(b) Loss of control of DG “A” Fuel Oil Day Tank SOV(s) and DG “A” Fuel Oil Transfer Pump are postulated due to an impacted common power supply cable (L0365) routed in this fire area. As a consequence, long-term fuel supply to KDG01A is not available challenging availability of the credited DG.
This VFDR is associated with the Vital Auxiliaries Function. [OP016, OP021]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DGS - 5907 - DG A FUEL OIL DAY TANK SOV {L0365(L)}

| | | |
|---|---|---|
| **Fire Area ID:** | CT - Cable Tunnel, Elevation 260' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

DGS - 5907A - FOTP A RECIRC SOV {L0365(L)}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {L0365(L), L0780(LC), L0782(LC)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. Plant Modification ESR-12-0412, providing fusing to protect against consequences of a hot short on Cable L0365, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-CT-050

**VFDR**

Procedure directed local action to “de-power” circuits to mitigate spurious operation may not be effective.
Local action is taken in Battery Room "A", at MAIN DC DISTRIBUTION PANEL "A" (DCPDPCB03A), to de-energize MCB DC DIST PNL "A" (DCPDPCB04A) at position #14 which fails components to their respective Loss Of Power position. As no additional local action is taken to assure the components remain in the desired position, subsequent fire-induced shorts to energized conductors of different circuits in conjunction with fire damage (grounds) could result in spurious operations.
Local action is taken in Battery Room "B", at MAIN DC DISTRIBUTION PANEL "B" (DCPDPCB03B), to de-energize MCB DC DIST PNL "B" (DCPDPCB04B) at position #9 which fails components to their respective Loss Of Power position. As no additional local action is taken to assure the components remain in the desired position, subsequent fire-induced shorts to energized conductors of different circuits in conjunction with fire damage (grounds) could result in spurious operations.

This VFDR is associated with the Reactivity Control Function, Inventory and Pressure Control Functions, Decay Heat Removal Function, and Vital Auxiliaries Function. [OE010, OP017, OP022, OP023, PH202, PH203]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - 4291 - TURBINE DRIVEN AUXILIARY FEEDWATER PUMP RECIRCULATION AOV {C3537(LC), G0721(LC), G0260(LI), Cascading Impact}
BDC - DCPDPCB03A - MAIN DC DISTRIBUTION PANEL A {Cascading Impact, Requires Operator Action}

**Fire Area ID:** CT - Cable Tunnel, Elevation 260' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

BDC - DCPDPCB03B - MAIN DC DISTRIBUTION PANEL B {Cascading Impact, Requires Operator Action}
CCW - 754A - CCW FROM RCP A TB AOV {R0629(LCI), Cascading Impact}
CCW - 754B - CCW FROM RCP B TB AOV {R0634(LCI), Cascading Impact}
CVC - 110B - RMW FLOW CONTROL VLV AOV-110B {R0034(LOI), Cascading Impact}
CVC - 110C - BLENDER OUTLET TO VCT (AOV) {R0035(LOI), Cascading Impact}
CVC - 111 - RMW TO BA BLENDER FLOW CONTROL VLV HCV-111 {R0036(LOI), Cascading Impact}
CVC - 112C - VCT OUTLET AOV {R0056(LC), R0060(LCI), Cascading Impact}
CVC - 200A - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), Cascading Impact}
CVC - 200B - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), Cascading Impact}
CVC - 202 - LTDN ORIFICE AOV {R0498(L), R0499(L), R0500(LOI), Cascading Impact}
CVC - 270A - RCP SEAL OUTLET AOV {R0525(LCI), Cascading Impact}
CVC - 270B - RCP SEAL OUTLET AOV {R0530(LCI), Cascading Impact}
CVC - 294 - CHRG TO LOOP B CL (AOV) {R0535(LOI), Cascading Impact}
CVC - 310 - EXCESS LTDN AOV {R0556(LOI)}
CVC - 312 - EXCESS LETDOWN HX DIVERT TO VCT OR RCDT AOV-312 {R0561(LOI), Cascading Impact}
CVC - 371 - RCS LETDOWN ISOLATION {R0567(LOI), Cascading Impact}
CVC - 392A - CHRG TO LOOP B HL (AOV) {R0549(LOI), Cascading Impact}
CVC - 427 - RCS LETDOWN ISOLATION {R0215(LCI), R0505(LC)}
MFW - 3995 - MAIN FW ISOLATION AOV TO S/G A {R4576(LOI), Cascading Impact}
RCS - 386 - RCP SEAL RETURN BYPASS {R0572(LOI), Cascading Impact}
RCS - 590 - REACTOR HEAD VENT OUTER (SOV) TO 592 {SAC0215(L), SAC0211A(LOI), Cascading Impact}
RCS - 591 - REACTOR HEAD VENT OUTER (SOV) TO 593 {SAC0216(L), SAC0214(LOI), Cascading Impact}
RCS - 592 - REACTOR HEAD VENT INNER (SOV) TO 590 {SAC0215(L), SAC0213(LOI), Cascading Impact}
RCS - 593 - REACTOR HEAD VENT INNER (SOV) TO 591 {SAC0216(L), SAC0212A(LOI), Cascading Impact}
SGB - 5737 - SGB B AOV {R3194(LO), R3192(LOI)}
SGB - 5738 - SGB A AOV {R3194(LO), R3192(LOI)}
SIS - 835A - ACCUM A FILL AOV {R0639(LOI), Cascading Impact}
SIS - 835B - ACCUM B FILL AOV {R0670(LOI), Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

| | | |
|---|---|---|
| **Fire Area ID:** | EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" | **Fire Area Definition** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Fire Zone ID | Description |
|---|---|
| EDG1A | 253'-6", Diesel Generator Unit 1A (including EDG Vault 1A) |

**Fire Area ID:** EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled byTrain “B” CVCS success path from the RWST to the RCS. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “B”:<br>o TDAFW Pump success path from the SG “B” MSS and pump suction from the CST or SWS<br>o SAFW Pump “D” success path from the SWS or FPS | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 5. Process Monitoring Function | RCS Temperature: TI-409A-2 (RCS LOOP A HL INDICATION) Location: IBELIP, TI-409B-2 (RCS LOOP A CL INDICATION) Location: IBELIP, | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |

**Fire Area ID:** EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | TI-410A-1 (RCS LOOP B HL INDICATION (0-700 F)) Location: MCB, and TI-410B-1 (RCS LOOP B CL INDICATION) Location: MCB<br>RCS Pressure:PI-420A (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB<br>Pressurizer Level:LI-428 (PRZR LEVEL CHANNEL 3) Location: MCB<br>Steam Generator Level:LI-460AA (S/G "A" LEVEL APPENDIX R [0-520" H2O (WR)) Location: IBELIP and LI-507 (S/G "B" LEVEL [0 - 520" H20 (WR)) Location: MCB<br>Steam Generator Pressure:PI-469A (S/G "A" PRESSURE) Location: IBELIP, and PI-478 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:N-32R (APPENDIX R SOURCE RANGE MONITOR) Location: IBELIP, AND NI-32B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022B (CDST "B" LEVEL) Location: MCB, and LI-920 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2015A (TDAFW PUMP DISCH FLOW) Location: IBELIP, FI-4085A (SAFW PUMP "D" <PSF01B> DISCH FLOW) Location: SAF, FI-4085B (SAFW PUMP "D", <PSF01B> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2105 ("B" DIESEL GEN HX OUTLET PRESS IND) Location: EDG1A | |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “B” of the BDC/IAC System from Battery “B” or the TSC Battery System.<br>• AC Power availability is maintained by train “B” Diesel-Generator and train “B” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train “B” SWS success path or alignment of alternate cooling from the FPS to the “B” Diesel. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |

| | | |
|---|---|---|
| **Fire Area ID:** | EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • Except for a Control Room fire, train "B" CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Scenario 1: Suppression Effects in EDG1A of a Fire Originating In EDG1A:

Activation of preaction sprinkler system, S12, or manual firefighting activities are not expected to extend beyond the area of fire origin.Preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box.The activation of a preaction sprinkler system would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in EDG1A of a Fire Originating Outside of EDG1A:

Actuation device S12M could be wetted by firefighting activities outside EDG1A which could cause the switch to short out, however, since preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box, operation of a fire suppression system outside of EDG1A could not impact preaction fire suppression systems within EDG1A.Similarly, manual firefighting activities outside of EDG1A would not be expected to affect equipment/components located within EDG1A.

**Fire Area ID:** EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Watertight manhole covers at the manholes between the diesel generator rooms and the vault below have been provided.Drain sump pumps have been provided along with backflow prevention capability.

**Fire Area ID:** EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R | Modifications: R<br>Procedures/Recovery Actions: R |
| EDG1A | 253'-6", Diesel Generator Unit 1A (including EDG Vault 1A) | R | E, R | None | Detection System, Heat Detectors for S12: E R<br>Detection System, Z20: E R<br>Water Suppression, S12: R |

**Title** Fire Risk Evaluation for Fire Area EDG1A

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 5.17E-09

**Δ LERF** Units: [1] 8.24E-11

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

S12, the fire detection (heat) and suppression system (automatic pre-action) installed in the fire area is credited in the Fire PRA, along with manual suppression, in response to fire scenarios that can be sufficiently severe as to include a structural steel fire scenario. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Fire Area ID:** EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

| | | |
|---|---|---|
| **Fire Area ID:** | EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| | |
|---|---|
| **VFDR ID** | VFDR-EDG1A-001 |
| **VFDR** | Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.<br>Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 112B, 112C, PCH01B, 624, and 626). However, this action may not be successful due to the integrity of instrument air piping.<br>This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH003]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue. |
| **Component(s)** | CVC - 112B - RWST TO CHARGING PUMP SUCTION {Loss of IA}<br>CVC - 112C - VCT OUTLET AOV {Cascading Impact, Loss of IA}<br>LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}<br>LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}<br>PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}<br>PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}<br>PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}<br>PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}<br>PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}<br>RHR - 624 - RHR HX OUTLET 1B {Loss of IA}<br>RHR - 626 - RHR HX OUTLET 1B {Loss of IA} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |

| | | |
|---|---|---|
| **Fire Area ID:** | EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| | |
|---|---|
| **VFDR ID** | VFDR-EDG1A-007 |
| **VFDR** | During postulated fire in this area, power to MCCJ can be lost due to lack of breaker coordination. None of the load feeder breakers from MCCJ are coordinated with the upstream incoming breaker. As a consequence, a fault on associated cable C1960 can result in loss of MCCJ. Loss of MCCJ affects credited “B” Diesel room cooling (ADF02A / ADF02B), DG Fuel Oil Transfer Pump (PDG02B) and DG Fuel Oil Day Tank level transmitter (LIT-2051A). This cascading impact affects credited KDG01B operation.<br>This VFDR is associated with the Vital Auxiliaries Function. [OP014]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | DBV - ADF02A - EDG B ROOM COOLING FAN {Cascading Impact}<br>DBV - ADF02B - EDG B ROOM COOLING FAN {Cascading Impact}<br>DGS - LIT-2051A - B D/G FUEL OIL DAY TANK (ALARM & CONTROL) {Cascading Impact}<br>DGS - PDG02B - DG FO TRANSFER PUMP B {Cascading Impact}<br>EAC - KDG01B - DIESEL-GENERATOR B {Cascading Impact}<br>LAC - ACPDPDG02 - DIESEL GENERATOR B HEAT TRACE PANEL {Cascading Impact}<br>LAC - MCCJ - MOTOR CONTROL CENTER J {C1960(P)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-EDG1A-009 |
| **VFDR** | A MSO concern exists related to spurious (ESF) Safety Injection Actuation due to a cascading loss of Train “A” DC power when Battery “A” is depleted. Actuation is possible due to:<br>(a) Low PZR pressure signal with two out of three PZR pressure transmitter loops (PT-429 and PT-430) impacted; - OR -<br>(b) Low PZR pressure signal (as above) AND either a low SG “B” pressure signal (from two out of three SG “B” pressure transmitter loops PI-479 and PT-483) OR a low SG “A” pressure signal (from two out of three SG “A” pressure transmitter loops PT-468 and PI-469).<br>This VFDR is associated with the Inventory and Pressure Control Functions. [OP005, OP006] |

**Fire Area ID:** EDG1A - Diesel Generator Unit 1A (including EDG Vault 1A), Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

MSS - PI-469 - S/G “A” PRESSURE (MCB){Cascading Impact}
MSS - PI-479 - S/G “B” PRESSURE (MCB) {Cascading Impact}
MSS - PT-468 - STM GEN “A” PRESS XMTR {Cascading Impact}
MSS - PT-483 - S/G “B” STM PRESS XMTR {Cascading Impact}
RPS - PT-429 - PRZR PRESS XMTR {Cascading Impact}
RPS - PT-430 - PRZR PRESS XMTR {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-EDG1A-010

**VFDR**

VCT Outlet AOV (112C) fails in the undesired (OPEN) position due to a cascading loss of DC power from Train “A” when Battery “A” is depleted. AOV failing open results in VCT inventory loss and damage to credited charging pumps due to loss of suction source.
This VFDR is associated with the Reactivity Control, and Inventory and Pressure Control Functions. [OMH403]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 112C - VCT OUTLET AOV {Cascading Impact}
CVC - 261 - VCT H2 INLT MANUAL BLK VLV {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| EDG1B | 253'-6", Diesel Generator Unit 1B (including EDG Vault 1B) |

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train “A” CVCS success path from the RWST to the RCS<br>o Train “A” SIS success path from the RWST to the RCS and the PORV associated with the “A” nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “A”:<br>o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS<br>o SAFW Pump “C” success path from the SWS or FPS | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

| | | |
|---|---|---|
| **Fire Area ID:** | EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • AC Power availability is maintained by train "A" Diesel-Generator and train "A" DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train "A" SWS success path or alignment of alternate cooling from the FPS to the "A" Diesel.<br>• Except for a Control Room fire, train "A" CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Scenario 1: Suppression Effects in EDG1B of a Fire Originating In EDG1B:

Activation of preaction sprinkler system S13, or manual firefighting activities are not expected to extend beyond the area of fire origin.Preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box.The activation of a preaction sprinkler system would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in EDG1B of a Fire Originating Outside of EDG1B:

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Actuation device S13M could be wetted by firefighting activities outside EDG1B which could cause the switch to short out, however, since preaction sprinkler systems require both, the fusing of a sprinkler head and the opening of the preaction valve as a result of actuation of a heat or smoke detector or manual pull box, operation of a fire suppression system outside of EDG1B could not impact preaction fire suppression systems within EDG1B.Similarly, manual firefighting activities outside of EDG1B would not be expected to affect equipment/components located within EDG1B.

Watertight manhole covers at the manholes between the diesel generator rooms and the vault below have been provided.Drain sump pumps have been provided along with backflow prevention capability.

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R, S | Modifications: R S<br>Procedures/Recovery Actions: R |
| EDG1B | 253'-6", Diesel Generator Unit 1B (including EDG Vault 1B) | R | E, R | E | 3hr rated barrier: E<br>Combustible Loading Controls: E<br>Detection System, Heat Detectors for S13: E R<br>Detection System, Z21: E R<br>Full height sheet metal enclosure: E<br>Water Suppression, S13: R |

**Title** Fire Risk Evaluation for Fire Area EDG1B

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 1.07E-06

**Δ LERF** Units: [1] 3.29E-09

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

S13, the fire detection (heat) and suppression system (automatic pre-action) installed in the fire area is credited in the Fire PRA, along with manual suppression, in response to fire scenarios that can be sufficiently severe as to include a structural steel fire scenario. Existing administrative control are

| | | |
|---|---|---|
| **Fire Area ID:** | EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" | **Fire Risk Evaluation** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

| | | |
|---|---|---|
| **Fire Area ID:** | EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-EDG1B-002

**VFDR**

During postulated fire in this area, power to MCCH can be lost due to lack of breaker coordination. None of the load feeder breakers from MCCH are coordinated with the upstream incoming breaker. As a consequence, a fault on associated cables (C1910 or C1950) can result in loss of MCCH. Loss of MCCH affects credited Diesel "A" room cooling (ADF01A / ADF01B), DG Fuel Oil Transfer Pump (PDG02A) and DG Fuel Oil Day Tank level transmitter (LIT-2050A). This cascading impact affects credited KDG01A operation.

This VFDR is associated with the Vital Auxiliaries Function. [OP014]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DBV - ADF01A - EDG A ROOM COOLING FAN {Cascading Impact}:
DBV - ADF01B - EDG A ROOM COOLING FAN {Cascading Impact}
DGS - LIT-2050A - A D/G FUEL OIL DAY TANK (ALARM & CONTROL) {Cascading Impact}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}
EAC - KDG01A - DIESEL-GENERATOR A {E0018(P), L0365(L), L0475(L), and Cascading Impact}
LAC - ACPDPDG01 - DIESEL GENERATOR A HEAT TRACE PANEL {Cascading Impact}
LAC - MCCH - MOTOR CONTROL CENTER H {C1910(P), C1950(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-EDG1B-003

**VFDR**

A MSO concern exists related to BUS14 power supply. With offsite power available, spurious closure of breaker 52/EG1A2 (cable L0510) can take place with KDG01A idle causing the reverse power relay trip signal to 52/EG1A2 (BUS18) and 52/EG1A1 (BUS14). A simultaneous spurious trip of BUS14 offsite infeed breaker 52/14 (cable L0472) results in a loss of both power sources to BUS14.

With offsite power not available, a spurious trip of breaker 52/EG1A2 (cable L0510) de-energizes BUS18. This results in a loss of KDG01A cooling water which, in turn, results in the loss of EAC power to BUS14.

This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP602]

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - 52/EG1A1 - EDG A SUPPLY TO BUS 14 {Cascading Impact}
EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0510(LOCI)}
EAC - KDG01A - DIESEL-GENERATOR A: {E0018(P), L0365(L), L0475(L), and Cascading Impact}
LAC - 52/14 - SPT SUPPLY BREAKER TO BUS 14 {L0472(LO)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100k W diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-EDG1B-004

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**VFDR**

A MSO concern exists related to flow diversion of the service water system. MOV-4780 is postulated to fail As-Is (Open) upon the loss of Train "B" AC electrical system; additionally, fire damage to cable C1956 would spuriously open in-series MOV-4609. This diverts Service Water flow from credited heat loads. Simultaneous cable damage (cable L0483 for PSW01A or cable L0487 for PSW01C) can cause a spurious trip of at least one credited Service Water pump reducing overall Service Water flow. With both valves open and at least one credited Service Water pump impacted, the resulting flow diversion reduces total Service Water flow to credited essential heat loads.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OMH741]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

SWS - 4609 - SCREEN HOUSE SW MOV {C1955(LI), C1956(LOC)}
SWS - 4780 - SCREEN HOUSE SW MOV {C5077(L), C2005(LI), C2006(LOC), C2004(P), E0091(P)}

| | |
|---|---|
| | SWS - PSW01A - SERVICE WATER PUMP A {L0483(LOCI), L0484(L)}<br>SWS - PSW01C - SERVICE WATER PUMP C {L0484(L), L0487(LOCI)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-EDG1B-005 |
| **VFDR** | MOV-4613 fails As-Is (Open) upon loss of the Train “B” electrical system and in-series MOV-4670 located in the affected fire area fails As-Is (Open). Simultaneous cable damage (cable L0483 for PSW01A, or cable L0487 for PSW01C) can cause a spurious trip of at least one credited Service Water pump. Turbine Generator Area isolation is required with less than two Service Water pumps running. With both valves open and at least one credited Service Water pump impacted, the resulting flow diversion reduces total Service Water flow to credited essential heat loads to less than required.<br>This VFDR is associated with the Vital Auxiliaries Function. [OP017, OMH742]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | SWS - 4613 - TGA ISOLATION MOV {Cascading Impact}<br>SWS - 4670 - TGA ISOLATION MOV {C1951(LI), C1950(P)}<br>SWS - PSW01A - SERVICE WATER PUMP A {L0483(LOCI), L0484(L)}<br>SWS - PSW01C - SERVICE WATER PUMP C {L0484(L), L0487(LOCI)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-EDG1B-010 |
| **VFDR** | The RWST is the credited source for Charging Pump suction. A loss of Train “B” 125V DC power or a loss of instrument air to AOV-112B causes the valve to fail closed isolating Charging Pump suction from the RWST resulting in pump damage. |

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OMH002]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {Cascading Impact}
CVC - 358 - CHARGING PUMP SUCTION FROM RWST MANUAL IV {Requires Operation}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-EDG1B-012

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**VFDR**

A MSO concern exists related to BUS18 power supply. Spurious opening of breakers 52/EG1A2 (cable L0510) and 52/18 (cable L0505, if offsite power is available) results in a loss of power to credited BUS18. The loss of power to BUS18 impacts KDG01A cooling capability from SW pumps PSW01A and PSW01C.
Local action is taken to align alternate cooling to KDG01A, strip the loads off BUS18, start KDG01A, and then load BUS18.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, PH601, PH602, PH603, PH604, PH605]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

EAC - 52/EG1A2 - EDG A SUPPLY TO BUS 18 {L0510(LOCI)}
EAC - KDG01A - DIESEL-GENERATOR A {E0018(P), L0365(L), L0475(L), Requires Operator Action}
FPS - 8588A - A D/G EMERGENCY COOLING FEED {Requires Operator Action}
LAC - 52/18 - SPT SUPPLY BREAKER TO BUS 18 {L0505(LOCI)}
LAC - 52/BT17-18 - BREAKER FOR BUS 17 TO BUS 18 TIE {L0429(LC), L0469(LOCI)}
LAC - 52/IH1A - BREAKER FOR EHTRCW01A (CIRCULATING WATER INTAKE HEATER A) {Cascading Impact}
LAC - 52/IH1C - BREAKER FOR EHTRCW01C (CIRCULATING WATER INTAKE HEATER C) {Cascading Impact}
LAC - 52/MCC1G1 - MOTOR CONTROL CENTER G SUPPLY G1 {L0499(LOCI)}

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

LAC - BUS18 - 480V SWITCHGEAR {L0429(LC), L0472(LC), L0504(LO), L0469(LOCI), L0505(LOCI), L0510(LOCI), Requires Operator Action}
SWS - 4667 - SW INLE BLOCK VLV TO D/G A HXS {Requires Operator Action}
SWS - 4667F - HOSE CONNECTION ISOL VLV TO D/G A HXS {Requires Operator Action}
SWS - PSW01A - SERVICE WATER PUMP A {L0484(L), L0483(LOCI)}
SWS - PSW01C - SERVICE WATER PUMP C {L0484(L), L0487(LOCI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action DCHFDTSCLT (or FSHFDTSCLT-DR) consists of aligning the TSC diesel generator and the TSC battery charger. Recovery Action FSHFD100KWDGTOBAT represents alignment of the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers. Either of these recovery actions provides power for long-term indication. These recovery actions take place in fire zones that are well separated. As such, at least one of these recovery actions can be implemented regardless of the fire damage. Therefore, these recovery actions were credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-EDG1B-014

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**VFDR**

Loss of control of DG “A” Fuel Oil Day Tank SOV(s) and DG “A” Fuel Oil Transfer Pump are postulated due to impacted common power supply cables (L0365 and L0475) routed in this fire area. As a consequence, long-term fuel supply to KDG01A is not available challenging availability of the credited DG.
This VFDR is associated with the Vital Auxiliaries Function. [OP016]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DGS - 5907 - DG A FUEL OIL DAY TANK SOV {L0365(L), L0475(L)}
DGS - 5907A - FOTP A RECIRC SOV {L0365(L), L0475(L)}
DGS - PDG02A - DG FO TRANSFER PUMP A {Cascading Impact}

**Disposition**

Modification ESR-12-0412, which protects Cable L0365 from fire damages, is credited to deterministically resolve this VFDR.

**VFDR ID** VFDR-EDG1B-015

**Fire Area ID:** EDG1B - Diesel Generator Unit 1B (including EDG Vault 1B), Elevation 253' 6" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.

Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 112B, 112C, PCH01A, 625, and 626). However, this action may not be successful due to the integrity of instrument air piping.

This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH003]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {Loss of IA}
CVC - 112C - VCT OUTLET AOV{Loss of IA}
CVC - PCH01A - CHRG PUMP A (Loss of IA)
LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}
RHR - 625 - RHR HX OUTLET 1A {Cascading Impact, Loss of IA}
RHR - 626 - RHR HX BYPASS {Cascading Impact, Loss of IA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**Fire Area ID:** INTAKE - Intake Structure, Tunnel, Disch Canal, Screen House forebay **Fire Area Definition**

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description |
|---|---|
| INTAKE | 228'-0", Intake Structure and Intake Tunnel |

| | | |
|---|---|---|
| **Fire Area ID:** | INTAKE - Intake Structure, Tunnel, Disch Canal, Screen House forebay | **Performance Goals** |
| **Compliance Basis:** | Not Applicable | |

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| Not Applicable | | |

**Fire Suppression Activities Effect on Nuclear Safety Performance Criteria**

Not Applicable

**Fire Area ID:** INTAKE - Intake Structure, Tunnel, Disch Canal, Screen House forebay

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| INTAKE | 228'-0", Intake Structure and Intake Tunnel | None | None | None | None |

**Fire Area ID:** OFFSITE - RG&E Cntrld Area South of Lake Rd other than Control House **Fire Area Definition**

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description |
|---|---|
| OFFSITE | RG&E Controlled Area South of Lake Road<br>Station 13A Outside Area |

**Fire Area ID:** OFFSITE - RG&E Cntrld Area South of Lake Rd other than Control House **Performance Goals**

**Compliance Basis:** Not Applicable

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| Not Applicable | | |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Not Applicable

**Fire Area ID:** OFFSITE - RG&E Cntrld Area South of Lake Rd other than Control House

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| OFFSITE | RG&E Controlled Area South of Lake Road<br>Station 13A Outside Area | None | None | None | None |

**Fire Area ID:** ONSITE - Site Area North of Lake Road outside of the Protected Area **Fire Area Definition**

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description |
|---|---|
| ONSITE | Owner Controlled Area North of Lake Road outside the Protected Area |

**Fire Area ID:** ONSITE - Site Area North of Lake Road outside of the Protected Area **Performance Goals**

**Compliance Basis:** Not Applicable

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| Not Applicable | | |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Not Applicable

**Fire Area ID:** ONSITE - Site Area North of Lake Road outside of the Protected Area

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| ONSITE | Owner Controlled Area North of Lake Road outside the Protected Area | None | None | None | None |

**Fire Area ID:** PA - Protected Area **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| PA-NE | 271'-0" Protected Area NE Quadrant |
| PA-NW | 271'-0" Protected Area NW Quadrant |
| PA-SE | 271'-0" Protected Area SE Quadrant |
| PA-SW | 271'-0" Protected Area SW Quadrant |

**Fire Area ID:** PA - Protected Area **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train “A” CVCS success path from the RWST to the RCS<br>o Train “A” SIS success path from the RWST to the RCS and the PORV associated with the “A” nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “A”: | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** PA - Protected Area **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS<br>o SAFW Pump “C” success path from the SWS or FPS | |
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

| | | |
|---|---|---|
| **Fire Area ID:** | PA - Protected Area | **Performance Goals** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System.<br>• AC Power availability is maintained by train “A” Diesel-Generator and train “A” DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train ”A” SWS success path or alignment of alternate cooling from the FPS to the “A” Diesel.<br>• Except for a Control Room fire, train “A” CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Not Applicable. This Fire Area is only considered in view of the Fire PRA.

**Fire Area ID:** PA - Protected Area **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R | Modifications: R<br>Procedures/Recovery Actions: R |
| PA-NE | 271'-0" Protected Area NE Quadrant | None | None | rr | Floor drains plugged: rr<br>Procedural Controls Regarding Securing Ventilation: rr |
| PA-NW | 271'-0" Protected Area NW Quadrant | None | None | None | None |
| PA-SE | 271'-0" Protected Area SE Quadrant | None | None | None | None |
| PA-SW | 271'-0" Protected Area SW Quadrant | None | None | rr | Floor drains plugged: rr |

**Title** Fire Risk Evaluation for Fire Area PA

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 4.55E-09

**Fire Area ID:** PA - Protected Area **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Δ LERF**

Units: [1] 6.01E-11

**DID Maintained**

A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The Fire PRA credits manual suppression in Fire Zone PA-NE, in response to transient fires. Given the relatively insignificant ignition frequencies and risk (CDF, LERF) in this fire area, no fire detection or suppression systems are required for DID. Hydrants are available in the fire area for fire brigade use and do not require additional DID enhancement. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

| | | |
|---|---|---|
| **Fire Area ID:** | PA - Protected Area | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-PA-001

**VFDR** A deterministic analysis assumption of a loss of offsite power and fire damage to the diesel air compressor (CSA05) would cause a loss of the Instrument Air and Service Air System. The loss of instrument air would result in the inability to manipulate air operated SSD components from the MCB (i.e., 112B, 112C, 625, 626, and PCH01A).
This VFDR is associated with the Vital Auxiliaries Function. [OP935]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {Loss of IA}
CVC - 112C - VCT OUTLET AOV {Loss of IA)
CVC - PCH01A - CHRG PUMP A {Loss of IA}
LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}
PSA - CSA05 - DIESEL AIR COMPRESSOR (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Located in Fire Area}
RHR - 625 - RHR HX A OUTLET {Loss of IA}
RHR - 626 - RHR HX BYPASS {Loss of IA}

**Disposition** This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-PA-008

**VFDR** The RWST is the credited source for Charging Pump suction. A loss of Train "B" 125V DC power or a loss of instrument air to AOV-112B causes the valve to fail closed isolating Charging Pump suction from the RWST resulting in pump damage.
This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OMH002]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

| | | |
|---|---|---|
| **Fire Area ID:** | PA - Protected Area | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Component(s)**

CVC - 112B - RWST TO CHARGING PUMP SUCTION {Cascading Impact}
CVC - 358 - CHARGING PUMP SUCTION FROM RWST MANUAL IV {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**Fire Area ID:** RC - Reactor Containment Building **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| RC-1 | 235’-8” Basement Floor |
| RC-2 | 253’-3” Intermediate Floor |
| RC-3 | 274’-6”, 278’-4” Operating Floor |
| T-LOOPA | 235’-8”, 253’-3”, 274’-6”, 278’-4” 1A Steam Generator |
| T-LOOPB | 235’-8”, 253’-3”, 274’-6”, 278’-4” 1B Steam Generator |
| T-PRZR | 253’-3”, 274'-6" Pressurizer |
| TREACTOR | 205’-10", 210’-0" Reactor |

**Fire Area ID:** RC - Reactor Containment Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train "A" CVCS success path from the RWST to the RCS<br>o Train "A" SIS success path from the RWST to the RCS and the PORV associated with the "A" nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG "A": | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** RC - Reactor Containment Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS<br>o SAFW Pump “C” success path from the SWS or FPS | |
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** RC - Reactor Containment Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train "A" of the BDC/IAC System from Battery "A" or the TSC Battery System.<br>• AC Power availability is maintained by train "A" Diesel-Generator and train "A" DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train "A" SWS success path or alignment of alternate cooling from the FPS to the "A" Diesel.<br>• Except for a Control Room fire, train "A" CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

(RC-1)

Scenario 1: Suppression Effects in RC-1 of a Fire Originating In RC-1:

There are no fixed suppression systems in RC-1 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

**Fire Area ID:** RC - Reactor Containment Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

Scenario 2: Suppression Effects in RC-1 of a Fire Originating Outside of RC-1:

There are no suppression systems in RC-1 that could be impacted by operation of a fire suppression system or manual firefighting outside of RC-1.
Float valves have been provided in drain boxes to minimize backflow.
(RC-2)
Scenario 1: Suppression Effects in RC-2 of a Fire Originating In RC-2:

There are no fixed suppression systems in RC-2 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in RC-2 of a Fire Originating Outside of RC-2:

There are no suppression systems in RC-2 that could be impacted by operation of a fire suppression system or manual firefighting outside of RC-2.

The Reactor Coolant Pumps are provided with spillage oil collection systems.
(RC-3)
Scenario 1: Suppression Effects in RC-3 of a Fire Originating In RC-3:

There are no fixed suppression systems in RC-3 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in RC-3 of a Fire Originating Outside of RC-3:

There are no suppression systems in RC-3 that could be impacted by operation of a fire suppression system or manual firefighting outside of RC-3.

**Fire Area ID:** RC - Reactor Containment Building **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R, S | Modifications: R S<br>Procedures/Recovery Actions: R |
| RC-1 | 235'-8" Basement Floor | None | E, D | rr | Detection System, Z08: E D<br>Floor drains/sump: rr<br>Procedural Controls Regarding Securing Ventilation: rr |
| RC-2 | 253'-3" Intermediate Floor | None | E, D | D, rr | Detection System, Z13: E D<br>Detection System, Z14: E D<br>Detection System, Z15: E D<br>Floor drains/sump: rr<br>Procedural Controls Regarding Securing Ventilation: rr<br>Radiant Energy Shield: D |
| RC-3 | 274'-6", 278'-4" Operating Floor | None | E, D | rr | Detection System, Z06: E D<br>Detection System, Z07: E D<br>Detection System, Z09: E D<br>Detection System, Z10: E D<br>Detection System, Z12: E D<br>Detection System, Z13: E D<br>Detection System, Z14: E D<br>Detection System, Z16D1: E D<br>Detection System, Z16D2: E D |

**Fire Area ID:** RC - Reactor Containment Building **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| | | | | | Floor drains/sump: rr<br>Procedural Controls Regarding Securing Ventilation: rr |
| T-LOOPA | 235’-8”, 253’-3”, 274’-6”, 278’-4” 1A Steam Generator | None | D | None | Detection System, Z54: D |
| T-LOOPB | 235’-8”, 253’-3”, 274’-6”, 278’-4” 1B Steam Generator | None | D | None | Detection System, Z55: D |
| T-PRZR | 253’-3”, 274'-6" Pressurizer | None | D | None | Detection System, Z56: D |
| TREACTOR | 205’-10", 210’-0" Reactor | None | None | None | None |

**Title** Fire Risk Evaluation for Fire Area RC

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 2.13E-08

**Δ LERF** Units: [1] 3.35E-10

**Fire Area ID:** RC - Reactor Containment Building **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**DID Maintained**

A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The Fire PRA credits manual suppression in Fire Zone RC-2, in response to transient fires. Given the relatively high fire frequency in the fire area, installed fire detection systems are credited for DID. There are no fire suppression systems in the fire area and no enhancements are required for DID. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

**Fire Area ID:** RC - Reactor Containment Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID** VFDR-RC-001

**VFDR**

A deterministic analysis assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the Service Air and Instrument Air Systems.
Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is required to manipulate air operated SSD components from the MCB (i.e. 4297, 4298, 112B, 112C, PCH01A, 625, and 626).
This VFDR is associated with the Vital Auxiliaries Function. [PH003]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-RC-002

**VFDR**

An inadvertent RCS pressure decrease and loss of sub-cooling is postulated due to spurious opening of Auxiliary Spray valve 296 (cables R0543, R0544, R0545) when a CHG Pump (PCH01A) is in service and pressurizer heaters (located in the fire area) are unavailable to be energized from the MCB due to fire damaged cables.
Local operator action is taken to:
(a) Close Instrument Air Containment Manual Isolation Valve (V-5397) to isolate Instrument Air to Containment. However, this action may not be successful to prevent spurious operation as the instrument air header is not vented.
(b) De-energize AOV-296 by opening breaker #6 at DCPDPCB04A in the MCR. However, operator action to “de-power” circuits to mitigate spurious

operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, OE010, OP017, OP957, PH903, PH908, PH911]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
CVC - 296 - AUX SPRAY AOV {R0546(LI), R0547(LI), R0548(LI), R0544(LO), R0545(LO), R0543(LOI)}
IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {C2205A(P), C2206A(P), C2207A(P), C2208A(P), C2209A(P), C2210A(P), C2211A(P), Cascading Impact}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {C2223A(P), C2224A(P), C2225A(P), C2226A(P), C2227A(P), C2228A(P), C2229(P)}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {C2212A(P), C2213A(P), C2214A(P), C2215A(P), C2216A(P), C2217A(P), Cascading Impact}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {C2230A(P), C2231A(P), C2232A(P), C2233A(P), C2234A(P), C2235A(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-RC-003

**VFDR**

A MSO concern exists related to Normal Letdown failing to isolate. Fire damage to cables for AOV-200A (R0506 or R0515) or AOV-200B (R0512 or R0508) or AOV-202 (R0516 or R0501); and AOV-427 (R0216, R0217, R0218, or R0219) spuriously opens the Normal Letdown line.
Operator action is taken at the MCB to mitigate the spurious actuations by opening breakers at DC power panels and removing fuses. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP017, OP023, PH901, PH902, PH912, PH913, PH914]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Fire Area ID:** RC - Reactor Containment Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Requires Operator Action}
CVC - 200A - LTDN ORIFICE AOV {R0507(LI), R0507A(LI), R0506(LO), R0515(LOI)}
CVC - 200B - LTDN ORIFICE AOV {R0513(LI), R0513A(LI), R0512(LO), R0508(LOI)}
CVC - 202 - LTDN ORIFICE AOV {R0517(LI), R0518(LI), R0516(LO), R0501(LOI)}
CVC - 427 - RCS LETDOWN ISOLATION {R0216(LCI), R0217(LC), R0218(LI), R0219(LI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-RC-004

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**VFDR**

A MSO concern exists relating to RCS Inventory Loss. Spurious operation of RCS Head Vent SOVs (590, 591, 592, and 593) is postulated in this fire area due to fire damaged cabling challenging RCS inventory control.
Operator action is taken to de-energize SOVs by opening breakers at DCPDPCB04A and DCPDPCB04B. However, operator action to "de-power" circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP017, OP022, PH905, PH907]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Requires Operator Action}
RCS - 590 - REACTOR HEAD VENT OUTER (SOV) TO 592 {R3592(LOI), R3592A(LOI), R3593(LOI), R3593A(LOI)}
RCS - 591 - REACTOR HEAD VENT OUTER (SOV) TO 593 {R3598(LOI), R3598A(LOI), R3599(LOI)}
RCS - 592 - REACTOR HEAD VENT INNER (SOV) TO 590 {R3594(LOI), R3594A(LOI), R3595(LOI), R3595A(LOI)}
RCS - 593 - REACTOR HEAD VENT INNER (SOV) TO 591 {R3596(LOI), R3596A(LOI), R3597(LOI)}

| | | |
|---|---|---|
| **Fire Area ID:** | RC - Reactor Containment Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-RC-005

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**VFDR**

3-Phase proper phase rotation shorts must be considered for high/low pressure interface in-series valves MOV-700, MOV-701, MOV-720, and MOV-721 since power cabling for the valves is routed through this area. Reliance on de-powering to prevent spurious opening requires assurance that no three-phase cabling of the same or higher voltage is routed in the same raceway between the MCC and the valve. Spurious operation of these valves results in a high/low pressure system interface concern. Additionally; an IN 92-18 concern exists, as identified in DA-EE-2000-066 – Attachment G.
This VFDR is associated with the Inventory and Pressure Control Functions, and Decay Heat Removal Function. [OP017, OP001, OP002, PC953]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

RHR - 700 - RHR PUMP SUCTION FROM RCS MOV {C0723(LOCI), C0721(P)}
RHR - 701 - RHR PUMP SUCTION FROM RCS {C1090(LOCI), C1088(P)}
RHR - 720 - RHR DISCHARGE TO LOOP B {C0716(LI), C0714(P)}
RHR - 721 - RHR DISCHARGE TO LOOP B {C1082(LI), C1080(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. The delta risk was qualitatively evaluated as insignificant based on the consideration that 3-phase proper polarity hot short are implausible. No recovery action was credited to resolve this VFDR.

**VFDR ID**

VFDR-RC-006

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**VFDR**

A MSO concern exists related to spurious (ESF) Safety Injection Actuation due to fire damage to instrument sensing lines and cables. Actuation is possible due to a low PZR pressure signal with two out of three PZR pressure transmitters loops (PT-429, PT-430 and PT-431) impacted.
This VFDR is associated with the Inventory and Pressure Control Functions. [OP017, OP005]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Fire Area ID:** RC - Reactor Containment Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**Component(s)**

RPS - PT-429 - PRZR PRESS XMTR {PT-429-LINE(I), R3407A(I), I/P-431A-LINE(L), I/P-431B-LINE(L), R1091A(LI), R1096A(LI)}
RPS - PT-430 - PRZR PRESS XMTR {PT-430-LINE(I), R3972(I)}
RPS - PT-431 - PRZR PRESS XMTR {PT-431-LINE(I), R0997(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-RC-007

**VFDR**

A MSO concern exists related to inadvertent PORV (430/431C) actuation as follows:
I. PORV opening and spurious operation/failure of block valves
(a) PORVs (430 and 431C) spuriously open (when required closed for HSD) due to fire damaged SOV cables (8616A, 8619A and 8620A for 430; 8616B, 8619B and 8620B for 431C) - AND -
(b) Block valves (515 and 516) fail as-is (open)
II. PORV opening due to high pressure signal
(a) High PZR pressure signals from PT-429 and either channel 2 (PT-430) or channel 3 (PT-431) actuates 430, - OR -
(b) High PZR pressure signals from PT-431 and either channel 1 (PT-429) or channel 4 (PT-449) actuates 431C, - OR -
(c) High PZR pressure signal from at least two out of the three transmitters (PT-450, PT-451 and/or PT-452) actuates BOTH 430 and 431C
Operator action is taken to mitigate spurious actuation by opening breakers at DC power panels in the MCR. However, operator action to "de-power" circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP007, OP008, OP009, OP011, OP017, PH904, PH906]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

BDC - DCPDPCB04A - MAIN CONTROL BOARD DC DIST PANEL A {Requires Operator Action}
BDC - DCPDPCB04B - MAIN CONTROL BOARD DC DIST PANEL B {Requires Operator Action}
IAS - 8619A - N2 ARMING SOV FOR PORV 430 {SAC0201A(LO), SAC0201B(LO), SAC0201C(LO)}
IAS - 8619B - N2 ARMING SOV FOR PORV 431C {SAC0202A(LO), SAC0202B(LO), SAC0202C(LO)}

**Fire Area ID:** RC - Reactor Containment Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

IAS - 8620A - PORV 430 ACTUATION SOV {R0276(LO), R0278(LO), SAC0203(LO)}
IAS - 8620B - PORV 431C ACTUATION SOV {R0277(LO), R0279(LO), SAC0204(LO)}
NAS - 8616A - ACCUM TO SURGE TANK SOV FOR PORV 430 {SAC0205A(LO), SAC0205B(LO)}
NAS - 8616B - ACCUM TO SURGE TANK SOV FOR PORV 431C {SAC0206A(LO), SAC0206B(LO)}
RCS - 430 - PORV (AOV) {R0278(LO), SAC0201A(LO), SAC0201B(LO), SAC0201C(LO), SAC0203(LO), R0276(LOI)}
RCS - 431C - PORV (AOV) {R0279(LO), SAC0202A(LO), SAC0202B(LO), SAC0202C(LO), SAC0204(LO), R0277(LOI)}
RCS - 515 - PORV BLOCK VALVE (MOV) FOR 431C {C1057(P), C1057A(P), C1059(LI), C0169A(LI)}
RCS - 516 - PORV BLOCK VALVE (MOV) FOR 430 {C0691(P), C0691A(P), C0693(LI), C0693A(LI)}
RPS - PT-429 - PRZR PRESS XMTR {PT-429-LINE(I), R3407A(I), I/P-431A-LINE(L), I/P-431B-LINE(L), R1091A(LI), R1096A(LI)}
RPS - PT-430 - PRZR PRESS XMTR {PT-430-LINE(I), R3972(I)}
RPS - PT-431 - PRZR PRESS XMTR {PT-431-LINE(I), R0997(I)}
RPS - PT-449 - PRZR PRESS XMTR {PT-449-LINE(I), R1037(I), I/P-431A-LINE(L), I/P-431B-LINE(L), R1091A(LI), R1096A(LI)}
RPS - PT-450 - RC OVERPRESS PROTECTION XMTR {PT-450-LINE(I), SAI0101(I)}
RPS - PT-451 - RC OVERPRESS PROTECTION {PT-451-LINE(I), SAI0102(I)}
RPS - PT-452 - RC OVERPRESS PROTECTION {PT-452-LINE(I), SAI0103(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-RC-008

**VFDR**

A separation concern exists for a postulated fire in this area impacting all four channels of MCB PRZR level instrumentation (LI-426, LI-428, LI-428A, and LI-433A). These components are considered unavailable to support SSD as a result of fire damage to HEMYC wrapped cabling.
This VFDR is associated with the Process Monitoring Function. [OE012, OP952, OP017]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

RCS - LI-426 - PRZR LEVEL (MCB) {LT-426-LINE(I), R3409A(I)}
RCS - LI-428 - PRZR LEVEL CHANNEL 3 (MCB) {LT-428-LINE(I), R1003(I)}

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| **Fire Area ID:** | RC - Reactor Containment Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

RCS - LI-428A - PRZR LEVEL (ABELIP) {LT-428A-LINE(I), R4085(I)}
RCS - LI-433A - PRZR LEVEL (MCB) {LT-433-LINE(I), R1133(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-RC-010

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**VFDR**

A separation concern exists for a postulated fire in this area impacting all three channels of MCB RCS pressure instrumentation (PI-420-2, PI-420A, and PI-420B). These components are considered unavailable to support SSD as a result of fire damage to HEMYC wrapped cabling.
This VFDR is associated with the Process Monitoring Function. [OE012, OP954, OP017]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

RCS - PI-420-2 - RCS HL PRESSURE (0-3000 PSIG at MCB) {PT-420-LINE(I), R0244(I)}
RCS - PI-420A - RCS PRESSURE (0-3000 PSIG at MCB) {PT-420A-LINE(I), R0877A(I)}
RCS - PI-420B - RCS PRESSURE (0-3000 PSIG at ABELIP) {PT-420B-LINE(I), R4087(I)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-RC-011

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**VFDR**

A separation concern exists for a postulated fire in this area impacting RCP seal cooling as follows:
(a) Fire damage to cables for RCP Seal Outlet Isolation valves AOV-270A (R0526 and R0527) and AOV-270B (R0531 and R0532) results in spurious valve closure AND fire damage to cable for RCP Seal Return Bypass valve AOV-386 (R0573 and R0574) results in spurious opening loss of control of this valve from the MCB.
(b) Fire damage to cables for RCP Thermal Barrier Outlet Isolation valves AOV-754A (R0630 or R0631) and AOV-754B (R0635 or R0636) results in

| | | |
|---|---|---|
| **Fire Area ID:** | RC - Reactor Containment Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

spurious valve closure.
This VFDR is associated with the Inventory and Pressure Control Functions. [OP017, OMH504, OMH505, OMH509, OMH510, OMH511]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CCW - 754A - CCW FROM RCP A TB AOV {R0631(LC), R0630(LCI), R0632(LI), R0633(LI)}
CCW - 754B - CCW FROM RCP B TB AOV {R0636(LC), R0635(LCI), R0637(LI), R0638(LI)}
CVC - 270A - RCP SEAL OUTLET AOV {R0527(LC), R0526(LCI), R0528(LI), R0529(LI)}
CVC - 270B - RCP SEAL OUTLET AOV {R0532(LC), R0531(LCI), R0533(LI), R0534(LI)}
RCS - 386 - RCP SEAL RETURN BYPASS {R0573(LOI), R0574(LOI)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. Plant Modification ESR-11-0305, which provides the RCP pumps with shutdown seals, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-RC-013

**VFDR**

A separation concern exists for a postulated fire in this area impacting (a) both SG “A” and “B” level indications, and (b) RCS Loop “A” and “B” (Hot and Cold Leg) temperature indications. The instruments are considered unavailable to support SSD as a result of fire damaged cabling.
This VFDR is associated with the Process Monitoring Function. [OP017, OP955]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

MFW - LI-460AA - S/G A LEVEL APPENDIX R (0-520 H2O)(WR at IBELIP) {LT-460A-LINE(I), R4081(I)}
MFW - LI-461 - S/G A LEVEL (NR AT MCB): {LT-461-LINE(I), R0876(I), R3403(I)}
MFW - LI-504 - S/G A LEVEL (WR) (0-520 H2O)(MCB): {LT-504-LINE(I), R4295(I)}
MFW - LI-506A - S/G B WIDE RANGE LEVEL (IBELIP): {LT-506-LINE(I), R4297(I)}
MFW - LI-507 - S/G B LEVEL (WR) (0-520 H2O)(MCB): {LT-507-LINE(I), R4298(I)}
RCS - TI-409A-1 - RCS LOOP A HL INDICATION (MCB): {R0225(I)}

| | |
|---|---|
| | RCS - TI-409A-2 - RCS LOOP A HL INDICATION (IBELIP): {R3557(I)}<br>RCS - TI-409B-1 - RCS LOOP A CL INDICATION (MCB): {R3993(I)}<br>RCS - TI-409B-2 - RCS LOOP A CL INDICATION (IBELIP): {R0222(I)}<br>RCS - TI-410A-1 - RCS LOOP B HL INDICATION (0-700 °F at MCB)): {R0231A(I)}<br>RCS - TI-410B-1 - RCS LOOP B CL INDICATION (MCB): {R3968(I)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-RC-015 |
| **VFDR** | A MSO concern exists related to Excess Letdown failing to isolate. Fire damage to cables for AOV-123 (R0078), AOV-310 (R0558 or R0557) and AOV-312 (R0562 or R0563) spuriously opens the Excess Letdown Heat Exchanger line.<br>Local action is taken to mitigate spurious actuation by opening breakers at DC power panels. However, operator action to “de-power” circuits to mitigate spurious operation may not be effective. A short to an energized conductor from another circuit in conjunction with fire damage (grounds) to both circuits can result in a spurious operation defeating de-powering the subject circuit.<br>This VFDR is associated with the Inventory and Pressure Control Functions. [OE010, OP017, OMH503]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | CVC - 123 - EXCESS LTDN FCV {R0078(LOC)}<br>CVC - 310 - EXCESS LTDN AOV {R0559(LI), R0560(LI), R0558(LO), R0557(LOI)}<br>CVC - 312 - EXCESS LETDOWN HX DIVERT TO VCT OR RCDT AOV-312 {R0564(LI), R0565(LI), R0562(LOI), R0563(LOI)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-RC-018 |

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|---|---|---|
| **Fire Area ID:** | RC - Reactor Containment Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR**

A MSO concern exists related to inadvertent RCS pressure decrease and loss of sub-cooling. The scenario is postulated due to the following separation concerns:
(a) Failure of PZR Heaters (EHTRRC01A, EHTRRC02A, EHTRRC01B, and EHTRRC02B), - AND -
(b) Inability to trip RCPs (PRC01A and PRC01B) from the MCB with spurious opening of PZR Spray valves (AOV-431A and AOV-431B)
Local operator action is taken to:
(a) Open the 4KV breakers to stop RCP 'A' (PRC01A) and RCP 'B' (PRC01B) - AND -
(b) Close Instrument Air Containment Manual Isolation Valve (V-5397) to isolate Instrument Air to Containment and prevent spurious PZR spray actuation. However, this action may not be successful to prevent spurious operation as the instrument air header is not vented.
This VFDR is associated with the Inventory and Pressure Control Functions. [OE001, OP017, OP957, PH903, PH909, PH910]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue and a separation issue.

**Component(s)**

IAS - 5397 - IA CNMT MAN ISOL VLV {Requires Operator Action}
RCS - 431A - PZR SPRAY VALVE (AOV) {R1091A(LOC)}
RCS - 431B - PZR SPRAY VALVE (AOV) {R1096A(LOC)}
RCS - EHTRRC01A - PRESSURIZER PROPORTIONAL HEATERS {C2205A(P), C2206A(P), C2207A(P), C2208A(P), C2209A(P), C2210A(P), C2211A(P) and Cascading Impact}
RCS - EHTRRC01B - PRESSURIZER BACKUP HEATERS {C2223A(P), C2224A(P), C2225A(P), C2226A(P), C2227A(P), C2228A(P), C2229(P)}
RCS - EHTRRC02A - PRESSURIZER PROPORTIONAL HEATERS {C2212A(P), C2213A(P), C2214A(P), C2215A(P), C2216A(P), C2217A(P) and Cascading Impact}
RCS - EHTRRC02B - PRESSURIZER BACKUP HEATERS {C2230A(P), C2231A(P), C2232A(P), C2233A(P), C2234A(P), C2235A(P)}
RCS - PRC01A - RCP A {C1282(L), C1283(L), M0046(P)}
RCS - PRC01B - RCP B {C1371(L), C1372(L), M0141(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No Recovery Action was credited to help resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**Fire Area ID:** SAF - Standby Auxiliary Feedwater Pump Building, Elevation 271' 0" **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| SAF | 271'-0", Stand-by AFW Building |

**Fire Area ID:** SAF - Standby Auxiliary Feedwater Pump Building, Elevation 271' 0" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train “A” CVCS success path from the RWST to the RCS<br>o Train “A” SIS success path from the RWST to the RCS and the PORV associated with the “A” nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “A”:<br>o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** SAF - Standby Auxiliary Feedwater Pump Building, Elevation 271' 0" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | o SAFW Pump “C” success path from the SWS or FPS | |
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** SAF - Standby Auxiliary Feedwater Pump Building, Elevation 271' 0" **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • AC Power availability is maintained by train "A" Diesel-Generator and train "A" DBV/DGS support components.<br>• Diesel-Generator engine cooling is maintained by the train "A" SWS success path or alignment of alternate cooling from the FPS to the "A" Diesel.<br>• Except for a Control Room fire, train "A" CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

**Fire Suppression Activities Effect on Nuclear Safety Performance Criteria**

Scenario 1: Suppression Effects in SAF of a Fire Originating In SAF:

There are no suppression systems in SAF and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in SAF of a Fire Originating Outside of SAF:

There are no suppression systems in SAF that could be impacted by operation of a fire suppression system or manual firefighting activities outside of SAF.

**Fire Area ID:** SAF - Standby Auxiliary Feedwater Pump Building, Elevation 271' 0" **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R | Modifications: R<br>Procedures/Recovery Actions: R |
| SAF | 271'-0", Stand-by AFW Building | None | E, D | None | Detection System, Z25: E D |

**Title** Fire Risk Evaluation for Fire Area SAF

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 1.05E-09

**Δ LERF** Units: [1] 2.06E-12

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

Given the absence of automatic fire suppression system in the fire area, it is prudent to credit the installed fire detection system for DID. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained** The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and

industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

**Fire Area ID:** SAF - Standby Auxiliary Feedwater Pump Building, Elevation 271' 0" **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID**

VFDR-SAF-003

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.

Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to manipulate air operated SSD components (i.e., 4298, 112B, 112C, PCH01A, 625, and 626). However, this action may not be successful due to the integrity of instrument air piping.

This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH003]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue.

**Component(s)**

AFW - 4298 - TDAFWP FCV TO S/G B {Cascading Impact, Loss of IA}
CVC - 112B - RWST TO CHARGING PUMP SUCTION {Cascading Impact, Loss of IA}
CVC - 112C - VCT OUTLET AOV{Loss of IA}
CVC - PCH01A - CHRG PUMP A {Loss of IA}
LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}
RHR - 625 - RHR HX OUTLET 1A {Loss of IA}
RHR - 626 - RHR HX BYPASS {Loss of IA}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**Fire Area ID:** SH - Screen House Building **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| INTAKE (Tunnel) | 212'-6" Intake Tunnel |
| SH-1 | 243'-6" and 239'-6", Screen House Basement |
| SH-2 | 253'-6", Screen House Operating Floor |
| SH-3 | 237'-0", SH CIRC Water Pump Area |

**Fire Area ID:** SH - Screen House Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled byTrain “B” CVCS success path from the RWST to the RCS. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “B”:<br>o TDAFW Pump success path from the SG “B” MSS and pump suction from the CST or SWS<br>o SAFW Pump “D” success path from the SWS or FPS | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |

**Fire Area ID:** SH - Screen House Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 5. Process Monitoring Function | RCS Temperature: TI-409A-2 (RCS LOOP A HL INDICATION) Location: IBELIP, TI-409B-2 (RCS LOOP A CL INDICATION) Location: IBELIP, TI-410A-1 (RCS LOOP B HL INDICATION (0-700 F)) Location: MCB, and TI-410B-1 (RCS LOOP B CL INDICATION) Location: MCB<br>RCS Pressure:PI-420A (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB<br>Pressurizer Level:LI-428 (PRZR LEVEL CHANNEL 3) Location: MCB<br>Steam Generator Level:LI-460AA (S/G "A" LEVEL APPENDIX R [0-520" H2O (WR)) Location: IBELIP and LI-507 (S/G "B" LEVEL [0 - 520" H20 (WR)) Location: MCB<br>Steam Generator Pressure:PI-469A (S/G "A" PRESSURE) Location: IBELIP, and PI-478 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:N-32R (APPENDIX R SOURCE RANGE MONITOR) Location: IBELIP, AND NI-32B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022B (CDST "B" LEVEL) Location: MCB, and LI-920 (RWST LEVEL) Location: MCB<br>System Flow Rate:<br>FI-2015A (TDAFW PUMP DISCH FLOW) Location: IBELIP, FI-4085A (SAFW PUMP "D" <PSF01B> DISCH FLOW) Location: SAF, FI-4085B (SAFW PUMP "D", <PSF01B> DISCH FLOW) Location: MCB<br>DG Cooling:<br>PI-2105 ("B" DIESEL GEN HX OUTLET PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “B” of the BDC/IAC System from Battery “B” or the TSC Battery System.<br>• AC Power availability is maintained by train “B” Diesel-Generator and train “B” DBV/DGS support components. | Method of Accomplishment (Hot Shutdown) Shutdown Method II Success Path "B" |

**Fire Area ID:** SH - Screen House Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • Diesel-Generator engine cooling is maintained by the train "B" SWS success path or alignment of alternate cooling from the FPS to the "B" Diesel.<br>• Except for a Control Room fire, train "B" CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

(SH-1)

Scenario 1: Suppression Effects in SH-1 of a Fire Originating In SH-1:

Suppression effects (activation of suppression systems and manual firefighting) are not expected to extend beyond the area of fire origin.Deluge system S17 in SH-1 is designed to spray cable trays in the Screenhouse basement.

Scenario 2: Suppression Effects in SH-1 of a Fire Originating Outside of SH-1:

The Screenhouse basement deluge system is actuated by the associated fire detection system in the area which could be vulnerable to a fire originating outside SH-1 if the detection circuits and/or control panel are routed or located outside the fire zone (e.g., SSA in the Relay Room).However, this system is

designed to spray on cable trays in the Screenhouse basement and suppression effects are not expected to extend beyond SH-1.Similarly, manual firefighting activities outside of SH-1 could potentially spray on, and short out a control panel that could activate the deluge system.However, the system is designed to spray on cable trays in the Screenhouse basement and suppression effects are not expected to extend beyond SH-1.

(SH-2)

Scenario 1: Suppression Effects in SH-2 of a Fire Originating In SH-2:

Suppression effects (activation of wet-pipe sprinkler system S18 or manual firefighting activities) are not expected to extend beyond the area of fire origin.Activation of an automatic sprinkler system would only be expected to activate small number of sprinklers.

Scenario 2: Suppression Effects in SH-2 of a Fire Originating Outside of SH-2:

Since automatic sprinkler systems are not electrically activated, operation of a fire suppression system outside of SH-2 could not impact the automatic sprinkler system within SH-2 that could have an impact on the nuclear safety performance criteria.Similarly, manual firefighting activities outside of SH-2 would not be expected to affect equipment/components located within SH-2.

A curb is installed around the diesel fire pump and the diesel oil storage tank to prevent the spread of flammable liquid.The curbed area is equipped with drains to a holding tank buried outside the Screenhouse.

Curbs are also provided to prevent water and flammable liquids from flowing into the basement area.

(SH-3)

Scenario 1: Suppression Effects in SH-3 of a Fire Originating In SH-3:

There are no fixed suppression systems in SH-3 and the effects of manual firefighting are not expected to extend beyond the area of fire origin.

Scenario 2: Suppression Effects in SH-3 of a Fire Originating Outside of SH-3:

There are no suppression systems in SH-3 that could be impacted by operation of a fire suppression system or manual firefighting outside of SH-3.

**Fire Area ID:** SH - Screen House Building **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

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**Fire Area ID:** SH - Screen House Building **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R | Modifications: R<br>Procedures/Recovery Actions: R |
| INTAKE (Tunnel) | 212'-6" Intake Tunnel | None | None | None | None |
| SH-1 | 243'-6" and 239'-6", Screen House Basement | E, D | E, R | E | Combustible Loading Controls: E<br>Detection System, Smoke Detectors for S17: E R<br>Physical separation greater than 20 ft.: E<br>Water Suppression, S17: E D |
| SH-2 | 253'-6", Screen House Operating Floor | E, D | E, R | E | Combustible Loading Controls: E<br>Detection System, Z26: E R<br>Physical separation greater than 20 ft.: E<br>Water Suppression, S18: E D |
| SH-3 | 237'-0", SH CIRC Water Pump Area | None | None | E | Combustible Loading Controls: E<br>Physical separation greater than 20 ft.: E |

**Title** Fire Risk Evaluation for Fire Area SH

| | | |
|---|---|---|
| **Fire Area ID:** | SH - Screen House Building | **Fire Risk Evaluation** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**Risk Summary**

The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF**

Units: [1] 8.35E-07

**Δ LERF**

Units: [1] 2.90E-09

**DID Maintained**

A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

The installed fire detection system is credited in the Fire PRA for Fire Zones SH-1 and SH-2 to support manual suppression. There are no installed fire detection and suppression systems in Fire Zone SH-3. Given that a structural steel fire scenario was identified for Fire Zone SH-2 and that such scenario could cause widespread damage, it is prudent to credit for DID the fire suppression systems installed in the fire area. Portable extinguishers and hose stations are available for fire brigade use and do not require additional DID enhancement. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

**Fire Area ID:** SH - Screen House Building **VFDRs**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

**VFDR ID**

VFDR-SH-001

**VFDR**

Fire damage to instrument air piping can challenge reliance on instrument/service air whether being aligned from the normal air compressors or from the diesel air compressor or a deterministic assumption of a loss of offsite power to BUS13 and BUS15 results in the loss of the normal Service Air and Instrument Air compressors.

Local manual alignment of Diesel Air Compressor (CSA05) to the Service Air and Instrument Air Systems is taken to support manipulation of air operated SSD components from the MCB (i.e., 4297, 4298, 112B, 112C, 9710A, 9710B, PCH01B). However, this action may not be successful due to the integrity of instrument air piping.

This VFDR is associated with the Vital Auxiliaries Function. [OE004, PH003]

This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

AFW - 4297 - TDAFWP FCV TO S/G A {Cascading Impact}
AFW - 4298 - TDAFWP FCV TO S/G B {Cascading Impact}
AFW - 9710A - SAFW PUMP "C" RECIRC TO CONDENSATE TEST TANK {Cascading Impact}
AFW – 9710B - SAFW PUMP "D" RECIRC TO CONDENSATE TEST TANK {Cascading Impact}
CVC - 112B - VCT OUTLET AOV {Cascading Impact}
CVC - 112C - RWST TO CHARGING PUMP SUCTION {Cascading Impact}
CVC - PCH01B - CHRG PUMP B {Cascading Impact}
LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT: {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE: {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER: {Requires Operator Action}
PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD: {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR: {Requires Operator Action}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

| | | |
|---|---|---|
| **Fire Area ID:** | SH - Screen House Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

**VFDR ID** VFDR-SH-003

**VFDR**

A MSO concern exists related to BUS16 power supply. With offsite power available, spurious closure of breaker 52/EG1B2 (cables L0434 or L0435) can take place with KDG01B idle causing the reverse power relay trip signal to 52/EG1B2 (BUS17) and 52/EG1B1 (BUS16). A simultaneous spurious trip of BUS16 offsite infeed breaker 52/16 (cables L0180 or L0701) results in a loss of both power sources to BUS16.
With offsite power not available, a spurious trip of breaker 52/EG1B2 (cables L0434 or L0435) de-energizes BUS17. This results in a loss of KDG01B cooling water which, in turn, results in the loss of EAC power to BUS16.
This VFDR is associated with the Vital Auxiliaries Function. [OP017, OP701]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

EAC - 52/EG1B1 - EDG B SUPPLY TO BUS 16 {Cascading Impact}
EAC - 52/EG1B2 - EDG B SUPPLY TO BUS 17 {L0434(LOC), L0435(LOCI) and Cascading Impact}
LAC - 52/16 - SPT SUPPLY BREAKER TO BUS16 {L0180(LO), L0701(LO)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID** VFDR-SH-005

**VFDR**

A MSO concern exists related to spurious DG start without SW cooling. Credited KDG01B can spuriously start due to cable (L0785).fire damage
Local action is taken to establish alternate cooling.
This VFDR is associated with the Vital Auxiliaries Function. [OP706, PH701, PH702, PH704]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA and a separation issue.

**Component(s)**

EAC - KDG01B - DIESEL-GENERATOR B {L0787(L), L0785(LC) and Cascading Impact}
FPS - 8589A - B D/G EMERGENCY COOLING FEED {Requires Operator Action}

| | | |
|---|---|---|
| **Fire Area ID:** | SH - Screen House Building | **VFDRs** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

| | |
|---|---|
| | SWS - 4668A - SW INLET BLOCK VLV TO D/G B HXS {Requires Operator Action}<br>SWS - 4668F - HOSE CONNECTION ISOL VLV TO D/G B HXS {Requires Operator Action}<br>SWS - PI-2105 - B DIESEL GEN OUTLET PRESS IND {Requires Operator Action}<br>SWS - PSW01B - SERVICE WATER PUMP B {E0031(P), E0031A(P), L0459A(L), L0461(P), L0462(LOCI), L0463(L), L0755(LOI)}<br>SWS - PSW01D - SERVICE WATER PUMP D {E0031(P), E0031A(P), L0459A(L), L0463(L), L0465(P), L0466(LOCI), L0756(LOI)} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No Recovery Action was credited to resolve this VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-SH-006 |
| **VFDR** | Normal cooling capability to credited TDAW Pump (PAF03) is challenged on loss of SW Pumps. SW Pumps are located in this fire.<br>This VFDR is associated with the Decay Heat Removal Function. [OP704]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | AFW - PAF03 - TURBINE DRIVEN AUXILIARY FEEDWATER PUMP: {Cascading Impact} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Actions AFHFDSUPPL-3, consisting of supplying alternate sources of water for the AFW system once the initial water supply is depleted, and AXHFDSAFWX-2, consisting of locally aligning the Standby AFW pump were credited to help resolve this VFDR. In addition, Plant Modifications ESR-11-0050 (fire protection upgrades to the Standby AFW pumps) and ESR-12-0143 (supporting diesel generator that can power a standby AFW pump) were credited to help resolve this VFDR. |
| **VFDR ID** | VFDR-SH-009 |
| **VFDR** | During postulated fire in this area, power to MCCJ can be lost due to lack of breaker coordination. None of the load feeder breakers from MCCJ are coordinated with the upstream incoming breaker. As a consequence, a fault on associated cable C2004 can result in loss of MCCJ. Loss of MCCJ affects credited “B” Diesel room cooling, DG Fuel Oil Transfer Pump (PDG02B) and DG Fuel Oil Day Tank level indicator (LIT-2051A). This cascading impact |

affects KDG01B operation.
This VFDR is associated with the Vital Auxiliaries Function. [OP014]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

DBV - ADF02A - EDG B ROOM COOLING FAN {Cascading Impact}
DBV - ADF02B - EDG B ROOM COOLING FAN {Cascading Impact}
DGS - LIT-2051A - B D/G FUEL OIL DAY TANK (ALARM & CONTROL) {Cascading Impact}
DGS - PDG02B - DG FO TRANSFER PUMP B {Cascading Impact}
EAC - KDG01B - DIESEL-GENERATOR B {L0787(L), L0785(LC) and Cascading Impact}
LAC - ACPDPDG02 - DIESEL GENERATOR B HEAT TRACE PANEL {Cascading Impact}
MCC - MCCJ - MOTOR CONTROL CENTER J {C2004(P)}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-SH-011

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**VFDR**

A MSO concern exists related to spurious (ESF) Safety Injection Actuation due to cascading loss of Train “A” DC power. Actuation is possible due to:
(a) Low PZR pressure signal with two out of three PZR pressure transmitter loops (PT-429 and PT-430) impacted - OR -
(b) Low PZR pressure signal (as above) AND either a low SG “B” pressure signal (from two out of three SG “B” pressure transmitter loops PI-479 and PT-483) OR a low SG “A” pressure signal (from two out of three SG “A” pressure transmitter loops PT-468 and PI-469).
This VFDR is associated with the Inventory and Pressure Control Functions. [OP005, OP006]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

MSS - PI-479 - S/G “B” PRESSURE (MCB) {Cascading Impact}
MSS - PT-483 - S/G “B” STM PRESS XMTR {Cascading Impact}
RPS - PI-469 - S/G “A” PRESSURE (MCB){Cascading Impact}

RPS - PT-429 - PRZR PRESS XMTR {Cascading Impact}
RPS - PT-430 - PRZR PRESS XMTR {Cascading Impact}
RPS - PT-468 - STM GEN "A" PRESS XMTR {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR.

**VFDR ID**

VFDR-SH-013

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**VFDR**

VCT Outlet AOV (112C) fails in the undesired (OPEN) position due to a cascading loss of DC power from Train "A". The AOV failing open results in VCT inventory loss and charging pumps drawing suction from the VCT cover gas instead of the RWST. This would damage the credited charging pumps. This VFDR is associated with the Reactivity Control, and Inventory and Pressure Control Functions. [OMH706]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 112C - VCT OUTLET AOV {Cascading Impact}
CVC - 261 - VCT H2 INLT MANUAL BLK VLV {Requires Operator Action}
CVC - PCH01B - CHRG PUMP B {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**VFDR ID**

VFDR-SH-014

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**VFDR**

A loss of charging capability is possible. The VCT can fill with high temperature water from RCP seal leakoff, via the Seal Water HX without CCW cooling, flashing steam in the VCT and causing VCT pressure to rise above head pressure of the RWST. When the CHG Pump is restarted, this result in the pump drawing suction from the VCT (instead of the RWST), introducing saturated water and thereby damaging the CHG pump. This scenario is postulated

due to the following separation concerns:
(a) Total loss of RCP seal cooling (Thermal Barrier AND Seal Injection) due to a LOOP (deterministic assumption) and loss of EAC power (SW pumps located in this fire area requires KDG01B to be stopped until alternate cooling is established, while KDG01A is deterministically assumed to be unavailable), - AND -
(b) VCT isolation valve (AOV-112C) fails open on a loss of instrument/service air OR loss of Train “A” DC power when Battery “A” is depleted, - AND -
(c) RCP seal leak-off isolation valve (MOV-313) fails open on loss of Train “A” AC power.
This VFDR is associated with the Reactivity Control, and Inventory and Pressure Control Functions. [OE003]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue.

**Component(s)**

CVC - 112C - VCT OUTLET AOV {Cascading Impact}
CVC - 313 - SEAL OR EXCESS LETDOWN RETURN ISOLATION MOV {Cascading Impact}
CVC - PCH01B - CHRG PUMP B {Cascading Impact}

**Disposition**

This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR.

**Fire Area ID:** STA13ACH - Station 13A Control House in RG&E Controlled Area **Fire Area Definition**

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description |
|---|---|
| STA13ACH | Station 13A Control House All Areas |

**Fire Area ID:** STA13ACH - Station 13A Control House in RG&E Controlled Area **Performance Goals**

**Compliance Basis:** Not Applicable

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| Not Applicable | | |

**Fire Suppression Activities Effect on Nuclear Safety Performance Criteria**

Not Applicable

**Fire Area ID:** STA13ACH - Station 13A Control House in RG&E Controlled Area

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| STA13ACH | Station 13A Control House All Areas | None | None | None | None |

**Fire Area ID:** WS - Contaminated Storage Building, Elevation 271' 0" **Fire Area Definition**

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description |
|---|---|
| WS | 271'-0", Contaminated Storage building |

**Fire Area ID:** WS - Contaminated Storage Building, Elevation 271' 0" **Performance Goals**

**Compliance Basis:** Not Applicable

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| Not Applicable | | |

### Fire Suppression Activities Effect on Nuclear Safety Performance Criteria

Not Applicable

**Fire Area ID:** WS - Contaminated Storage Building, Elevation 271' 0"

**Compliance Basis:** Not Applicable

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| WS | 271'-0", Contaminated Storage building | None | None | rr | Procedural Controls Regarding Flood Barriers: rr |

**Fire Area ID:** YARD - Transformer Yard General Area **Fire Area Definition**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description |
|---|---|
| YARD | 271'-0" Transformer Yard General Area |

**Fire Area ID:** YARD - Transformer Yard General Area **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
| --- | --- | --- |
| 1. Reactivity Control Function | Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative ractivity insertion into the reactor core. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 2. Inventory Control Function | • RCS inventory depletion control is maintained by closure of all letdown paths, all sample paths, all head vent paths, and both PORVs.<br>• RCS inventory makeup is controlled by either one of the following:<br>o Train “A” CVCS success path from the RWST to the RCS<br>o Train “A” SIS success path from the RWST to the RCS and the PORV associated with the “A” nitrogen surge tank. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 3. Pressure Control Function | • RCS high pressure control is maintained by automatic mechanical operation of all PRZR Code Safety Valves, stopping of both RCPs, and securing all PRZR heaters.<br>• RCS lowering pressure control is maintained by closure of both PRZR PORVs, closure of both PRZR Normal Spray valves or stopping the associated RCP(s), and closure of both SG ARVs. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 4. Decay Heat Removal Function | • RCS high temperature control is maintained by automatic mechanical operation of all SG Code Safety Valves.<br>• RCS lowering temperature control is maintained by closure of both MSIVs, closure of both SG ARVs, stopping both MFW Pumps, stopping AFW System flow to the non-credited SG, and controlling flow to the credited SG.<br>• SG makeup control is maintained by either one of the following to SG “A”:<br>o TDAFW Pump success path from the SG “A” MSS and pump suction from the CST or SWS<br>o SAFW Pump “C” success path from the SWS or FPS | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** YARD - Transformer Yard General Area **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| 5. Process Monitoring Function | RCS Temperature:TI-409A-1 (RCS LOOP A HL INDICATION) Location: MCB, and TI-409B-1 (RCS LOOP A CL INDICATION) Location: MCB<br>RCS Pressure:PI-420-2 (RCS HL PRESSURE (0-3000 PSIG)) Location: MCB, and PI-420B (RCS PRESSURE (0-3000 PSIG)) Location: ABELIP<br>Pressurizer Level:LI-426 (PRZR LEVEL) Location: MCB, LI-428A (PRZR LEVEL (WR)) Location: ABELIP, and LI-433A (PRZR LEVEL) Location: MCB<br>Steam Generator Level:LI-461 (S/G "A" LEVEL (NR)) Location: MCB, LI-504 (S/G "A" LEVEL [0-520" H2O (WR)) Location: MCB, and LI-506A (S/G "B" WIDE RANGE LEVEL) Location: IBELIP<br>Steam Generator Pressure:PI-469 (S/G "A" PRESSURE) Location: MCB, and PI-479 (S/G "B" PRESSURE) Location: MCB<br>Neutron Flux Monitoring:NI-31B (NIS SOURCE RANGE INDICATION) Location: MCB<br>Tank Level:LI-2022A (CDST "A" LEVEL) Location: MCB, and LI-921 (RWST LEVEL) Location: MCB<br>System Flow Rate:FI-2031 (TDAFW PUMP DISCH FLOW) Location: MCB, FI-4084A (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: SAF, FI-4084B (SAFW PUMP "C" <PSF01A> DISCH FLOW) Location: MCB<br>DG Cooling:PI-2103 ("A" DIESEL GEN HX CLNG WTR HDR PRESS IND) Location: EDG1A | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |
| 6. Vital Auxiliaries | • DC Power and instrument power availability is maintained by train “A” of the BDC/IAC System from Battery “A” or the TSC Battery System.<br>• AC Power availability is maintained by train “A” Diesel-Generator and train “A” DBV/DGS support components. | Method of Accomplishment (Hot Shutdown) Shutdown Method I Success Path "A" |

**Fire Area ID:** YARD - Transformer Yard General Area **Performance Goals**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Performance Goal | Method of Accomplishment | Comments |
|---|---|---|
| | • Diesel-Generator engine cooling is maintained by the train ”A” SWS success path or alignment of alternate cooling from the FPS to the “A” Diesel.<br>• Except for a Control Room fire, train “A” CREATS is maintained for controlling the Control Room environmental conditions within the required specifications for habitability and design limits for equipment operability. Ventilation systems for the SAFW components in the SAFW Building, the DG components in the Diesel Building, and the TSC components in the Technical Support Center are maintained for equipment design limits. | |

| References | Document ID |
|---|---|
| | EIR 51-9089546-001 Rev. 001 - R. E. Ginna Nuclear Power Station, Nuclear Safety Capability Assessment |

**Fire Suppression Activities Effect on Nuclear Safety Performance Criteria**

Scenario 1: Suppression Effects in YARD of a Fire Originating In YARD:

Suppression effects (activation of suppression systems and manual firefighting) are not expected to extend beyond the area of fire origin.Deluge systems in the YARD are designed to spray their associated transformer.

Scenario 2: Suppression Effects in YARD of a Fire Originating Outside of YARD:

The transformer deluge systems are actuated by the associated fire detection system or manual pull boxes which could be vulnerable to afire originating outside YARD and to automatic and manual firefighting activities if the detection circuits, electric manual pull boxes, or control panel are routed or located outside the fire zone (e.g., SSA in the Relay Room).However, these systems are designed to spray on their respective transformer and suppression effects are not expected to extend beyond YARD.

**Fire Area ID:** YARD - Transformer Yard General Area **Fire Risk Evaluation**

**Compliance Basis:** NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions

| Fire Zone ID | Description | Required Suppression System | Required Detection System | Required Fire Protection Feature | Required Fire Protection Feature and System Details |
|---|---|---|---|---|---|
| (All) | Area Wide | None | None | R | Modifications: R<br>Procedures/Recovery Actions: R |
| YARD | 271'-0" Transformer Yard General Area | D | D | None | Detection System, Heat Detectors for S20: D<br>Detection System, Heat Detectors for S21: D<br>Detection System, Heat Detectors for S22: D<br>Detection System, Heat Detectors for S23: D<br>Water Suppression, S20: D<br>Water Suppression, S21: D<br>Water Suppression, S22: D<br>Water Suppression, S23: D |

**Title** Fire Risk Evaluation for Fire Area YARD

**Risk Summary** The delta CDF and delta LERF results for the fire area are summarized below. At the fire area level, the increase in risk is less than 1E-06/rx-yr for the delta CDF, and less than 1E-07/rx-yr for the delta LERF.

All CCDPs and CLERPs are less than 1, ensuring that low CDF and LERF values are not reached solely because of a low fire scenario frequency.

**Δ CDF** Units: [1] 9.67E-09

**Δ LERF** Units: [1] 4.66E-11

**DID Maintained** A qualitative evaluation of defense-in-depth (DID) using insights gained from the Fire PRA was performed for the fire area.

| | | |
|---|---|---|
| **Fire Area ID:** | YARD - Transformer Yard General Area | **Fire Risk Evaluation** |
| **Compliance Basis:** | NFPA 805 Section 4.2.4.2 Performance-Based Approach - Fire Risk Evaluation with simplifying deterministic assumptions | |

None of the installed fire detection and suppression systems present in the fire area are credited in the Fire PRA. Given the moderately high frequency of fires in that fire area, it is prudent to credit the installed fire detection and suppression systems for DID. Existing administrative control are determined adequate given the nature of combustibles in the area and the quantified scenarios captured in the Fire PRA results. Given the relatively low values of CCDP and CLERPs in the fire area, no DID actions are required. In addition, no modifications are required for DID in the fire area.

With the DID requirements above, the evaluation finds that an adequate balance between the DID echelons is maintained.

**Safety Margin Maintained**

The safety margin for the analyses supporting the fire risk evaluation of the fire area was evaluated and accounted for potential impacts from fire modeling and the plant system performance, including the PRA logic model. All analyses and assessment have been performed utilizing accepted techniques and industry accepted standards. In addition, safety analysis acceptance criteria in the licensing basis (e.g., FSAR, supporting analyses) have been considered and provide sufficient margin to account for analysis and data uncertainty.

**Conclusions**

**VFDR ID** VFDR-YARD-001

**VFDR**

A deterministic analysis assumption of a loss of offsite power (to BUS13 and BUS15) results in the loss of the Service Air and Instrument Air Systems.
Local manual alignment of diesel air compressor (CSA05) to the Service Air and Instrument Air Systems is required to manipulate air operated SSD components from the MCB (i.e., 112B, 112C, PCH01A, 625, and 626).
This VFDR is associated with the Vital Auxiliaries Function. [PH003]
This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a pre-transition OMA issue.

**Component(s)**

LAC - BUS13 - 480V SWITCHGEAR {Cascading Impact}
LAC - BUS15 - 480V SWITCHGEAR {Cascading Impact}
PSA - 7000A - IA/SA CROSS-CONNECT {Requires Operator Action}
PSA - 7002D - DIESEL AIR COMPRESSOR SUPPLY ISOLATION VALVE {Requires Operator Action}
PSA - 7195A - BU AIR COMP DISCHARGE INNER ISOL VAL TO SERV AIR HEADER {Requires Operator Action}

PSA - 7203 - SERV AIR ISOL VALVE TO THE TURBINE BUILDING FROM YARD {Requires Operator Action}
PSA - CSA05 - DIESEL AIR COMPRESS (OUTSIDE UNIT) FOR BU SERV AIR/INSTR AIR {Requires Operator Action}

| | |
|---|---|
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. No recovery action was credited to resolve the VFDR. No plant modification was credited to provide a specific delta risk reduction for the VFDR. |
| **VFDR ID** | VFDR-YARD-008 |

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| | |
|---|---|
| **VFDR** | The RWST is the credited source for Charging Pump suction. A loss of Train "B" 125V DC power or a loss of instrument air to AOV-112B causes the valve to fail closed isolating Charging Pump suction from the RWST resulting in pump damage.<br>This VFDR is associated with the Reactivity Control Function, and Inventory and Pressure Control Functions. [OMH002]<br>This condition represents a variance from the deterministic requirements of NFPA 805, Section 4.2.3. This is a separation issue. |
| **Component(s)** | CVC - 112B - RWST TO CHARGING PUMP SUCTION {Cascading Impact}<br>CVC - 358 - CHARGING PUMP SUCTION FROM RWST MANUAL IV {Requires Operation} |
| **Disposition** | This VFDR was evaluated for compliance using the performance-based approach of NFPA 805, Section 4.2.4.2. A delta risk evaluation was performed. Recovery Action RCHFDMAKEUP, consisting of locally aligning and starting the new charging system was credited to help resolve this VFDR. In addition, Plant Modification ESR-12-0144, which provides a standby Charging pump in the SB AFW building, was credited to help resolve this VFDR. |

| Fire Area | Component Description | Recovery Actions |
|---|---|---|
| ABBM | New DG and new bus related to ESR-12-0143 | Operators locally align and start SB AFW pump powered from dedicated diesel generator associated with Plant Modifications ESR-11-0050 and ESR-12-0143. |
| ABBM | Bus 15 and 16 supply breaker, 43/TSC manual switch | Operators locally align the TSC Diesel Generator. |
| ABBM | TSC Battery, Battery room disconnect panel switch, TSC/Battery A/B manual throwover panel OR 100 kW Diesel Generator (KBD01A). | Operators locally align the TSC battery charger OR operators locally align the 100 kW Diesel Generator (KBD01A) directy to the battery chargers. |
| ABBM | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| ABBM | DI tank (TCD05) related to ESR-11-0050. | Operators provide alternate sources of water to the AFW system. *Note 1 |
| ABBM | Charging pumps | Operators locally secure charging pumps. |
| ABI | New DG and new bus related to ESR-12-0143, SB AFW pump | Operators locally align and start SB AFW pump powered from dedicated diesel generator associated with Plant Modifications ESR-11-0050 and ESR-12-0143. |
| ABI | TSC Battery, Battery room disconnect panel switch, TSC/Battery A/B manual throwover panel OR 100 kW Diesel Generator (KBD01A). | Operators locally align the TSC battery charger OR operators locally align the 100 kW Diesel Generator (KBD01A) directy to the battery chargers. |
| ABI | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| ABI | DI tank (TCD05) related to ESR-11-0050. | Operators provide alternate sources of water to the AFW system. *Note 1 |
| ABI | Reactor trip breakers | Operator locally trips the reactor |
| ABI | Charging pumps | Operators locally trip charging pumps. |
| BOP | TSC Battery, Battery room disconnect panel switch, TSC/Battery A/B manual throwover panel OR 100 kW Diesel Generator (KBD01A). | Operators locally align the TSC battery charger OR operators locally align the 100 kW Diesel Generator (KBD01A) directy to the battery chargers. |
| BOP | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| BR1A | TSC Battery, Battery room disconnect panel switch, TSC/Battery A/B manual throwover panel OR 100 kW Diesel Generator (KBD01A). | Operators locally align the TSC battery charger OR operators locally align the 100 kW Diesel Generator (KBD01A) directy to the battery chargers. |
| BR1A | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| BR1B | TSC Battery, Battery room disconnect panel switch, TSC/Battery A/B manual throwover panel OR 100 kW Diesel Generator (KBD01A). | Operators locally align the TSC battery charger OR operators locally align the 100 kW Diesel Generator (KBD01A) directy to the battery chargers. |
| BR1B | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |

| Fire Area | Component Description | Recovery Actions |
|---|---|---|
| CC | DI tank (TCD05) related to ESR-11-0050. | Operators provide alternate sources of water to the AFW system. *Note 1 |
| CC | New DG and new bus related to ESR-12-0143, SB AFW pump | Operators locally align and start SB AFW pump powered from dedicated diesel generator associated with Plant Modifications ESR-11-0050 and ESR-12-0143. |
| CC | Bus 15 and 16 supply breaker, 43/TSC manual switch | Operators locally align the TSC Diesel Generator. |
| CC | TSC Battery, Battery room disconnect panel switch, TSC/Battery A/B manual throwover panel | Operators locally align the TSC battery charger. |
| CC | POS #14 MCB DC Distribution Panel A, POS#9 MCB DC Distribution Panel B | Operators locally depower DC loads. |
| CC | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| CC | Charging pumps | Operators locally trip charging pumps. |
| CC | Reactor Trip Push Button and 52/13 & 52/15 feeder breakers | Operator locally trips the reactor. |
| CT | DI tank (TCD05) related to ESR-11-0050. | Operators provide alternate sources of water to the AFW system. *Note 1 |
| CT | New DG and new bus related to ESR-12-0143, SB AFW pump | Operators locally align and start SB AFW pump powered from dedicated diesel generator associated with Plant Modifications ESR-11-0050 and ESR-12-0143. |
| CT | Bus 15 and 16 supply breaker, 43/TSC manual switch | Operators locally align the TSC Diesel Generator. |
| CT | TSC Battery, Battery room disconnect panel switch, TSC/Battery A/B manual throwover panel OR 100 kW Diesel Generator (KBD01A). | Operators locally align the TSC battery charger OR operators locally align the 100 kW diesel generator (KBD01A) directly to the battery chargers. |
| CT | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| CT | Charging pumps | Operators locally trip charging pumps. |
| CT | Reactor Trip Push Button and 52/13 & 52/15 feeder breakers | Operator locally trips the reactor. |
| EDG1A | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| EDG1B | TSC Battery, Battery room disconnect panel switch, TSC/Battery A/B manual throwover panel OR 100 kW Diesel Generator (KBD01A). | Operators locally align the TSC battery charger OR operators locally align the 100 kW diesel generator (KBD01A) directly to the battery chargers. |
| EDG1B | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |

| Fire Area | Component Description | Recovery Actions |
|---|---|---|
| PA | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| | | |
| SH | New DG and new bus related to ESR-12-0143, SB AFW pump | Operators locally align and start SB AFW pump powered from dedicated diesel generator associated with Plant Modifications ESR-11-0050 and ESR-12-0143. |
| SH | DI tank (TCD05) related to ESR-11-0050. | Operators provide alternate sources of water to the AFW system. *Note 1 |
| SH | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |
| | | |
| YARD | New RCS injection system related to Plant Modification ESR-12-0144 | Operators locally align and start the new RCS injection system associated with Plant Modification ESR-12-0144. |

**NOTE 1:** The recovery action to provide alternate souces of water to the AFW system is no longer a credited Recovery Action. It was determined there is over 24 hours of DI water available using TCD05 (Reference DA-ME-17-001 Rev. 1). The fire PRA does not model the risk associated with this action since it is over 24 hours and therefore, it is not considered a “Recovery Action”.

# PART IV SAFE SHUTDOWN ANALYSIS

## 1.0 Introduction

## 1.1 Objective

The objective of this part of the FPPR is to describe the fire protection features that ensure safe and stable shutdown capability at R.E. Ginna Nuclear Power Plant and the relationship of these features to the requirements of NFPA 805. The results of this evaluation indicate that safe and stable shutdown can be achieved to meet 5 nuclear safety performance criteria (NSPC) defined under Section 1.5.1 of NFPA 805, as follows:

1. Reactivity control: Capability of inserting negative reactivity to achieve and maintain subcritical conditions. Negative reactivity insertion is to occur rapidly enough such that fuel design limits are not exceeded.
2. Inventory and pressure control: With fuel in the reactor vessel, head on and tensioned, inventory and pressure control are capable of controlling coolant level such that subcooling is maintained for a pressurized water reactor.
3. Decay heat removal: Capability of removing sufficient heat from the reactor core or spent fuel such that fuel is maintained in a safe and stable condition.
4. Vital auxiliaries: Vital auxiliaries are to provide the necessary auxiliary support equipment and systems to assure that the systems required under 1, 2, 3, and 5 are capable of performing their required nuclear safety function.
5. Process monitoring: Capability of providing the necessary indication to ensure that criteria addressed in 1 through 4 have been achieved and are being maintained.

To demonstrate that the 5 criteria above are met, the Nuclear Safety Capability Assessment (NSCA) Reference 1.2.1 and 1.2.21, used a Safe Shutdown Equipment List list (SSEL) (now located in the cable tracking software, ref. 1.2.21), that is, a list of systems and equipment that are relied upon to achieve the previous criteria, and which also includes those systems and equipment whose fire-induced failure could prevent the operation or result in the maloperation of the components needed to meet these criteria. Since the majority of systems and equipment rely on electrical circuits for their proper operation, fire-induced damage to cables that support these circuits is accounted for in the NSCA.

Per Section 4.2.2 of NFPA 805, the NSCA is performed for each fire area of the plant. A fire area is defined in Section 1.6.14 of NFPA 805 as an area that is physically separated from other areas by space, barriers, walls, or other means in order to contain fire within that area. Two approaches are allowed to demonstrate that the nuclear safety performance criteria are met: a deterministic approach and a performance-based approach. For a given fire area, the deterministic approach starts by postulating a fire area wide fire and relies on separation and fire protection criteria to demonstrate that a success path of required cables and equipment is free of fire damage. In applying the deterministic approach, cases where cables or equipment are co-

located in the fire area such that the deterministic criteria are not met correspond to variances from deterministic requirements (VFDRs). To determine whether these VFDRs can be kept as-is without the need for further plant modifications to bring the plant to deterministic compliance, the risk-informed approach is used. At Ginna, the risk-informed approach was accomplished as fire risk evaluations (FREs). FREs use core damage frequency (CDF) and large early release frequency (LERF) calculated from the plant's Fire Probabilistic Risk Assessment (Fire PRA) as risk metrics that are evaluated against acceptance guidelines given in Regulatory Guide 1.174 (Reference 2) to determine whether the increase in risk due to VFDRs is within acceptable thresholds. FREs must also demonstrate that adequate defense-in-depth and safety margins are maintained. The FRE was used to transition to NFPA 805, as documented in reference 1.2.2. The outut of the FRE determined what recovery actions and/or modifications are relied upon in the fire PRA.

Historically, Appendix R exemptions were requested and approved for those plant areas where literal compliance to Appendix R Section III.G was not achieved. Reference 1.2.4 concluded that the exemptions from 10 CFR Part 50, Appendix R are to be superseded by the the R.E. Ginna Nuclear Power Station Fire Protection Program that complies with 10 CFR 50.48 (c). The fire protection features and attributes required to meet the nuclear performance criteria of NFPA 805 are considered "Adequate for the Hazard".

The NRC approvals from the specific requirements of NFPA 805 Chapter 3 along with the basis for granting the request are also included in this section.

## 1.2 References

1. 51-9089546-001, R.E. Ginna NFPA 805 Nuclear Safety Capability Assessment. This reference is "historic". It was superseded by 0028-0011-007-001.

2. HAI-0028-0011-002-003, R.E. Ginna Nuclear Power Station NFPA 805 Fire Risk Evaluations. This reference is "historic". It was developed as part of the NFPA 805 project and was used as an input to determine what recovery actions and modifications were required to achieve and safe and stable hot shutdown condition. It is classified "historic" since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

3. 51-9064339-003, NFPA 805 Fundamental Fire Protection Program and Design Elements Transition Review. This reference is "historic". It was classified "historic" to capture the B-1 Table as presented to the NRC to support the approved NFPA 805 License Amendment Request (WPLNRC-1003035). The B-1 Table now resides in Appendix B. Changes to the B-1 Table are made using IP-FPP-1.

4. DA-ME-13-001 Rev. 0, Evaluation of Ginna Nuclear Station Appendix R Exemptions for Transition to NFPA 805

5. R.E. Ginna Nuclear Power Plant, Docket No. 50-244, License Amendment Request (LAR) Pursuant to 10 CFR 50.90: Adoption of NFPA 805, Performance Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 edition).

6. NEI 00-01, Rev. 2 – Guidance for Post-Fire Safe Shutdown Circuit Analysis

7. NFPA 805 - Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants – 2001 Edition

8. Calculation 32-9183379-001, RE Ginna NFPA 805 Coordination Study. This reference is "historic". It was used as an input to the NSCA. It is classified "historic" since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

9. DA-EE-2000-066 Rev. 2, Appendix R Conformance Analysis

10. U.S. Nuclear Regulatory Commission, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Regulatory Guide 1.174, Revision 2, May 2011 (ADAMS Accession No. ML100910006).

11. U.S. Nuclear Regulatory Commission, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results For Risk Informed Activities," Regulatory Guide 1.200, Revision 2, March 2009 (ADAMS Accession No. ML090410014).

12. U.S. Nuclear Regulatory Commission, "Fire Protection for Nuclear Power Plants," Regulatory Guide 1.189, Revision 2, October 2009 (ADAMS Accession No. ML092580550).

13. Pacher, Joseph, E., Exelon Generation, letter to U.S. Nuclear Regulatory Commision, "R.E. Ginna Nuclear Power Plant, Renewed Facility Operating License No. DPR-18, Docket No. 50-244, Response to Request for Additional Information," dated June 11, 2015 (ADAMS Accession Nos. ML 15167A504 and ML 15167A505).

14. DA-ME-14-020, Deionized Water Tank Inventory Requirements.

15. ER-AA-600-1068, Fire PRA Risk Evaluation Support for NFPA 805 Program.

16. LS-AA-128-101, Regulatory Review of Proposed Changes to the Approved NFPA 805 Fire Protection Program.

17. Pacher, Joseph, E., Constellation Energy Nuclear Group, letter to U.S. Nuclear Regulatory Commission, "R.E. Ginna Nuclear Power Plant, Docket No. 50-244, License Amendment Request Pursuant to 10 CFR 50.90: Adoption of NFPA 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants (2001 Edition)," dated March 28, 2013 (ADAMS Accession No. ML13093A064).

18. R.E. Ginna Nuclear Power Plant – Issuance of Amendment regarding tranisition to a risk informed, performance-based fire protection program in accordance with title 10 of the code of federal regulations section 50.48 (c) (ADAMS Accesion No. ML15271A101).

19. Pacher, Joseph, E., Exelon Generation, letter to U.S. Nuclear Regulatory Commission, “R.E. Ginna Nuclear Power Plant, Renewed Facility Operating License No. DPR-18, Docket N0. 50-244, Supplement to License Amendment to Transition to NFPA 805,” dated September 5, 2014 (ADAMS Accession No. ML14258A006).

20. 0028-0018-000-001, Qualification of Hemyc Fire Barrier Wrap in Battery Room B at Ginna Station.

21. 0028-0011-007-001, Ginna NFPA 805 Nuclear Safety Capability Assessment. This reference is “historic”. It was developed as an input to the NFPA 805 transition to ultimately determine what recovery actions and modifications were required to achieve and safe and stable hot shutdown condition. It is classified “historic” since it represents the plant as it was at a specific time. Changes to the plant follow the modification process which includes procedurally evaluating a modification for impact to SSD, NPO, the fire PRA, and to the fire program. Changes include a regulatory review as well.

22. Genesis Solution Suite software for cable tracking.

23. ECP-18-000200-309-101-01, Engineering Technical Evaluation – Tear in Hemyc Wrap HWCB03.

## 1.3 Overview

This part contains the following sections:

Section 2.0 contains the fire areas and compliance strategy summary that were assessed for safe and stable shutdown in the NSCA.

Section 3.0 contains the definitions and assumptions used in the NSCA.

Section 4.0 provides a discussion relative to the Fire Area Transition to NFPA 805.

Section 5.0 provides descriptions of the safe shutdown system, equipment, components, and instrumentation credited for use in the NSCA analysis.

Section 6.0 provides a discussion of the Primary Control Stations.

Section 7.0 provides the analysis results, including NFPA 805 exemptions and orders, description of safe shutdown capability by fire area, pre-fire strategies, configuration control, and NRC approvals from the requirements of NFPA 805 Chapter 3.

Section 8.0 provides information on operator actions/procedures, ~~repairs~~, pre-fire strategies, description of SSD by fire area, configuration control, and fire wrap.

Section 9.0 provides a discussion of the communication systems and equipment credited by operations personnel when performing safe shutdown activities.

Section 10.0 discusses emergency lighting.

# 2.0 Fire Area and Compliance Strategy

Ginna is a single unit PWR with 20 individual fire areas, 15 of which contribute to the delta CDF and delta LERF, and each fire area is composed of multiple fire zones. The NSCA was performed on a fire area basis and also identified the individual fire zones within the fire areas. This table represents the fires areas that were analyzed which used the Performance-Based (PB) approach in accordance with Chapter 4 of NFPA 805.

| **Fire Area** | **Description** | **NFPA 805 Compliance Basis** |
|---|---|---|
| ABBM | Auxiliary Building Basement/Mezzanine | Performance-Based |
| ABI | Auxiliary Building/ Intermediate Building | Performance-Based |
| BOP | Balance of Plant | Performance-Based |
| BR1A | Battery Room 1A | Performance-Based |
| BR1B | Battery Room 1B | Performance-Based |
| CC | Control Complex | Performance-Based |
| CHG | Charging Pump Room | Performance-Based |
| CT | Cable Tunnel | Performance-Based |
| EDG1A | Diesel Generator Unit 1A | Performance-Based |
| EDG1B | Diesel Generator Unit 1B | Performance-Based |
| PA | Protected Area | Performance-Based |
| RC | Reactor Containment Building | Performance-Based |
| SAF | Standby Auxiliary Feedwater Pump Building | Performance-Based |
| SH | Screen House Building | Performance-Based |
| YARD | Transformer Yard General Area | Performance-Based |
| STA13ACH | Station 13A Control House | Performance-Based |
| INTAKE | Intake Structure | Performance-Based |

# 3.0 Definitions and Assumptions

## 3.1 Definitions

This section presents the terminology used in the fire area assessment included in the NSCA

1. Alternative (Remote) Shutdown:
   Alternative (Remote) Shutdown is the use of a diverse system in lieu of the preferred system to achieve a safe and stable condition of the reactor because redundant components of preferred shutdown systems can be adversely impacted by a common fire in the fire area

of concern. Alternative (Remote) Shutdown generally involves one or both of the following conditions:

- Key shutdown activities are controlled/conducted outside of the Control Room (i.e., from remote shutdown locations), or
- Plant systems are utilized in a manner that is diverse from their normal operation.

2. Associated Circuits by Common Enclosure:
   Circuits that share a common enclosure with safe shutdown circuits or equipment. Enclosures include panels, junction boxes, and raceways (conduit and cable trays).

3. Associated Circuits by Common Power Supply:
   Circuits that share a common power supply with safe shutdown circuits or equipment. Power supplies include those that provide motive power, control power and instrument power.

4. Associated Circuits by Spurious Operation:
   Circuits whose fire induced failures could result in spurious operation of equipment that could adversely affect achieving safe and stable conditions.

5. Associated Circuits of Concern
   Circuits associated by common power supply, common enclosure, and/or spurious operation that meet the following conditions:

   - Are not separated by rated fire barriers.
   - Have the potential to impair safe shutdown capability by causing the loss of a safe shutdown power supply due to lack of coordinated circuit protection or inducing a spurious operation which adversely affects safe shutdown capability.
   - Share an enclosure with a safe shutdown circuit without adequate electrical protection or without protection against fire propagation from one fire area to another.

6. Cold Shutdown:
   The reactor is in the cold shutdown condition when all reactor vessel head closure bolts are fully tensioned, reactivity ($k_{eff}$) is < 0.99, and average reactor coolant temperature ≤ 200 $^0$F.

7. Cold Shutdown Equipment:
   Plant equipment used to transition the reactor from hot shutdown to cold shutdown and maintain the reactor in a cold shutdown condition.

8. Fire:
   An exposure fire in a given fire area that involves in-situ and/or transient combustibles and is external to any structures, systems or components located in or adjacent to that same fire area. The effects of such a fire (e.g., smoke, heat or flame impingement) can adversely affect those structures, systems or components.

9. Fire Area:
   The portion of a building or plant that is separated from other areas by boundary fire barriers. Fire areas could consist of one or a combination of fire zones.

10. Fire Barrier:
    Those components of construction including walls, floors, and supports (beams, joists, and columns), penetration seals or closures, fire doors, and fire dampers rated by an approving laboratory in hours of resistance to fire, and are used to prevent the spread of fire.

11. Fire Zones:
    Subdivisions of fire areas within the plant designated as potential fire hazard zones.

12. High/Low Pressure Interface Components:
    A valve whose spurious opening could result in a loss of RCS inventory and, due to lower pressure rating on the downstream piping, an interfacing LOCA outside of Primary Containment (i.e., pipe rupture in the low pressure piping). NEI 00-01, Appendix C, and FAQ 06-0006 provide additional information.

13. Hot Shutdown:
    The reactor is in the hot shutdown condition when reactivity ($k_{eff}$) is < 0.99 and average reactor coolant temperature ≥ 350 $^0$F.

14. Hot Standby:
    The reactor is in the hot standby condition when all reactor vessel head closure bolts are fully tensioned, reactivity ($k_{eff}$) is < 0.99, and average reactor coolant temperature < 350 $^0$F > 200 $^0$F.

15. Local Control:
    Operation of equipment manually or using remote controls specifically designed for this purpose from a location other than the Main Control Room in order to maintain the fuel in a safe and stable condition.

16. Operator Action:
    Action taken by an operator from inside the Main Control Room or at a Primary Control Station.

17. Operator Manual Action:
    Operation / manipulation / observation of components or process variables outside the Main Control Room locally at the equipment to support shutdown from the Main Control Room or the Primary Control Station.

18. Performance Goals (PB):
A set of functional criteria that ensure the plant will achieve and maintain a hot shutdown condition and be able to be subsequently cooled down to a cold shutdown condition.

19. Post-Fire:
The time and plant conditions following a fire event.

20. Primary Control Station (PCS):
A station where dedicated shutdown or alternative shutdown controls have been reviewed and approved by the NRC. These locations become primary when command and control is shifted from the main control room to these other locations.

At REG there are two primary control stations (PCSs) outside the MCR:
1. Charging Pump Room – located in Fire Area CHG, Elevation 235’-8” (ABELIP)
2. Intermediate Building North – located in Fire Area ABI, Elevation 253’-6” (IBELIP)

21. Recovery Action:
Activities to achieve the nuclear safety performance criteria that take place outside of the Main Control Room or outside of a Primary Control Station(s) for the equipment being operated, including the replacement or modification of components.

22. Repair:
Physical modifications that are performed in response to fire in order to safely shutdown the plant. Repairs are allowed for equipment needed to achieve and maintain cold shutdown. Repairs include the following activities:
- Replacement of damaged components
- Replacement of cabling
- Modifications (e.g., wiring changes)
- The use of a tool (e.g., screwdriver, pliers, wrench, wire cutters)
- Installation of a component (e.g., fuse, pneumatic or electrical jumper)

23. Remote Shutdown Capability:
Remote shutdown capability is a means to maintain the fuel in a safe and stable condition and is provided by rerouting, relocating or modifying existing systems to ensure the ability to achieve and maintain safe shutdown conditions independent of the equipment associated with certain fire areas. (See also Alternative Shutdown).

24. Safe and Stable:
For the purpose of this analysis, the ability to maintain hot shutdown conditions.

25. Safe Shutdown:

The process for achieving post-fire Safe and Stable plant conditions.

26. Safe Shutdown Equipment/Circuit:
Equipment (and circuits) that are used for achieving and maintaining safe shutdown in the event of a fire in a fire area.

27. Safe Shutdown System:
A plant system or a portion thereof that is used to achieve and maintain the post-fire safe shutdown performance goals.

28. Spurious Operation:
The undesirable operation of plant components caused by electrical circuits energized or deenergized as a result of fire damage. Spurious operation could also be caused by mal-operation of the existing logic interlocks between different components as a result of fire-induced damage.

29. Unrecoverable Condition:
A point in the sequence of an event where no reasonable action is available to recover plant conditions consistent with defined performance goals. Temporary deviation from performance goals is acceptable provided plant conditions can be restored prior to breaching fuel cladding integrity or reactor coolant system pressure boundary integrity. Generally, these deviations are supported by NRC Safety Evaluation Reports, NRC safety evaluations, or NRC granted exemptions/deviations.

30. Variance From Deterministic Requirements (VFDR):
Conditions that do not meet the Deterministic Approach requirements as provided in NFPA 805 Section 4.2.3.

## 3.2 Assumptions

The following assumptions were considered when selecting systems and shutdown paths.

A. Maintaining hot shutdown without the use of pressurizer heaters (i.e. controlling pressurizer level through CVCS (Chemical Volume Control System)/SIS (Safety Injection System)) is considered in the Fire Area Assessments (FAAs). The pressurizer heaters are not required to achieve and maintain NSPC but they are credited where available.

B. The classification of shutdown capability as alternative shutdown is made independent of the selection of systems used for shutdown. Alternative shutdown capability is determined based on an inability to assure the availability of a safe shutdown path.

C. 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 unit is assumed to be operating at full power under normal conditions and normal lineups.

D. UFSAR accidents or other design basis events (e.g. LOCA, earthquake, etc.), single failures or non-fire induced transients are not considered in conjunction with the fire.

E. Offsite power (from the grid/main generator) is not credited in any fire areas. However, offsite power is assumed to remain available for those cases where its availability could adversely impact safety (i.e., reliance cannot be placed on fire causing a LOOP if the consequences of offsite power availability are more severe than its presumed loss). No credit is taken for a fire causing a LOOP. Shutdown is evaluated both where offsite power is available and where offsite power is not available.

F. Post-fire SSD systems and components are not required to be safety-related.

G. Cooling water systems required to support SSD system operation are considered as part of the NSCA. These include:
- CCW Heat Exchanger cooling water
- Service Water

H. HVAC systems (e.g., Main Control Room (CREATS), SAFW Pump Building, Emergency Diesel-Generator Rooms, and TSC Rooms) available to support safe and stable plant conditions are considered as part of the NSCA. (Relay Room HVAC is not required for the plant to achieve Nuclear Safety Performance Criteria (NSPC)).

I. When determining the process monitoring functions to include in the analysis, various reference documents were used. NEI 00-01 defers to NRC Information Notice 84-09 as providing guidance as to the instrumentation acceptable to the NRC for meeting the process monitoring function. This guidance, however, is not specific as to the diagnostic information that should be provided by the analysis except for the major reactor parameter indications, as an example. As such, other documents were reviewed to determine the minimum set of indications that would be necessary to assure the process monitoring function was adequately provided. P&ID's were reviewed in conjunction with the related SSEL as identified in DA-EE-2000-066. The specific instruments required are based on operator preference, safe shutdown procedural guidance strategy (symptomatic vs. prescriptive), and systems and paths selected for the shutdown strategy.

J. Spurious actuations of automatic systems due to fire damage are evaluated in the FAAs.

K. No credit was taken for instrument air in the NSCA, however, the adverse effects of a fire-induced mal-operation of instrument air were not ruled out and are included in the NSCA. That is, spurious operation of AOVs that could challenge an NSCA success path and that require operation of instrument air to occur were considered plausible in the NSCA.

# 4.0 Fire Area Transition to NFPA 805

The Fire Area Transition (NEI 04-02 Table B-3) was performed using the methodology contained in NEI 04-02 and FAQ 07-0054. This table is located in Appendix H and provides for each fire area, the following:

- The approach used in accordance with NFPA 805 was the Performance-Based (PB) approach in accordance with Section 4.2.4 of NFPA 805.
- The SSCs required to meet the NSCA.
- Fire detection and suppression systems required to meet the NSPC.
- An evaluation of the effects of fire suppression activities on the ability to achieve NSPC.

  The damage to plant areas and equipment from the accumulation of water discharged from manual and automatic fire protection ssytems within the fire area and the discharge of automatic and manual suppression water to adjacent compartment is controlled. Fire suppression activities will not adversely affect the plant's ability to achieve the NSPC.

- The disposition of each VFDR using either; modifications (completed or committed) or the performance of a Fire Risk Evaluation (FRE) in accordance with Section 4.2.4.2 of NFPA 805. The final list of committed modifications based on the results of the Fire PRA is included in Appendix G.

# 4.1 Multiple Spurious Operations

The NSCA considered potential impact of multiple spurious component actuations per the guidance of NEI 00-01. MSO scenarios that potentially negatively impact post-fire shutdown were identified in the NSCA (reference 1.2.1 and 1.2.21).

## 4.2 High/Low Pressure Interface Equipment

The following high/low pressure interface valves, that use redundant de-energized electrically controlled devices to isolate primary coolant boundaries, were identified in the NSCA (reference 1.2.1 and 1.2.21) as:

- MOV-700, RHR PUMP SUCTION FROM RCS
- MOV-701, RHR PUMP SUCTION FROM RCS
- MOV-720, RHR DISCHARGE TO LOOP B
- MOV-721, RHR DISCHARGE TO LOOP B

Note: The delta risk for various VFDRs associated with the above high/low interface valves was qualitatively evaluated as insignificant based on the consideration that 3-phase proper polarity hot short are implausible (reference 1.2.13).

## 4.3 Cable Tracking database

The cables necessary to operate and/or maintain the status of each safe shutdown component can be obtained from Ginna's cable tracking database.

# 5.0 Systems Analysis Input

## 5.1 Safe Shutdown Systems, Equipment, and Functions

In accordance with the general criteria and assumptions discussed in the preceding sections, safe shutdown systems and equipment are selected for the Ginna Station that will:

1. Attain the previously defined performance goals for achieving and maintaining safe and stable conditions (hot shutdown); and,
2. Offsite power (from the grid/main generator) is not credited in any fire areas. However, offsite power is assumed to remain available for those cases where its availability could adversely impact safety (i.e., reliance cannot be placed on fire causing a LOOP if the consequences of offsite power availability are more severe than its presumed loss). No credit is taken for a fire causing a LOOP. Shutdown is evaluated both where offsite power is available and where offsite power is not available.

A list of safe shutdown equipment (SSEL) can be found in the cable tracking database (reference 1.2.22).
The following subsections provide a general discussion of the systems that are credited with achieving safe and stable conditions at Ginna Station.
The Nuclear Safety Capability Assessment (NSCA) (reference 1.2.1 and 1.2.21) identifies that NFPA 805 does not provide any definitions of, or make any distinctions for "Alternative Shutdown" or "Dedicated Shutdown" capability. The formally named "Alternate Shutdown" or "Dedicated Shutdown" stations are now referred to as a "Primary Control Station (PCS)".

PCSs are documented as the Charging Pump Room (ABELIP) and the Intermediate Building North (IBELIP) stations.

Appendix I includes a consolidated list of the Recovery Actions and Appendix G includes the modifications committed to for NFPA 805 compliance. Ginna committed to installing new equipment, including a dedicated diesel generator, and powering an exiting SBAFW and a new injection pump, as part of the NFPA 805 project to be utilized as the primary equipment to address VFDRs associated with a loss of feedwater and a loss of charging, rather than Charging Pump 1A and the TDAFW. This equipment will remain free from fire damage for all fire scenarios of concern. Ginna stated in the LAR that this shutdown strategy does not require the use of the ABELIP and IBELIP. For these reasons, Table G-1 in Attachment G of the LAR does not identify any required activities that occur at the PCSs (i.e., PCS actions are no longer required in order to address any VFDRs). Note: PCSs actions will continue to be credited until the required NFPA 805 modifications are fully implemented.

## 5.1.1 Chemical and Volume Control System

The charging portion of the Chemical and Volume Control System (CVCS) accomplishes the following safety functions:

1. Reactivity control by injecting a soluble chemical neutron absorber (boron) into the RCS;
2. Inventory control by maintaining water inventory to the RCS; and,
3. Pressure control by providing makeup capability to the RCS.

Normal reactivity control for hot shutdown capability is provided via control rods with boric acid addition used to compensate for the xenon decay and plant cooldown. The control and shutdown rod groups ensure the reactor is maintained subcritical (consistent with technical specification shutdown margin) following trip with the most reactive rod stuck out of the core. For the assumed fire scenario, no stuck-rod condition need be assumed, thus providing a greater shutdown margin.

When the unit is at power, the quantity of boric acid retained in the refueling water storage tank (RWST) and ready for injection into the RCS always exceeds that quantity required for normal cold shutdown. This quantity also exceeds the quantity of boric acid required to bring the reactor to hot shutdown and to compensate for subsequent xenon decay. Sufficient boron concentration to assure safe shutdown is maintained in the RWST as required by plant technical specifications.

Numerous CVCS flow paths are normally available for charging to the RCS. The normal charging flow path, independent of the safety injection flow path, will provide for reactor cool- ant make-up, boration and pressure control. This flow path is shown on drawing 33013-1265, Sheets 1 and 2. Charging, pressure control and boration can be accomplished by operation of any charging pump taking suction from the RWST and injecting borated water into the RCS. Suction to the charging pump can be lined up from the RWST by locally opening one normally closed valve located in the Charging Pump Room.

The "A" charging pump speed control is provided by back up pressurized air cylinders and regulator if plant instrument air is lost.

Seal leak-off flow is required to cool the RCP seals. The reactor coolant pump No. 1 seal return and excess letdown line motor-operated valve V-313 fails as-is. In that condition, seal return flow will be to the volume control tank (through the seal water heat exchanger) or to the pres-

surizer relief tank through a relief valve inside containment to ensure a flow path is available. RCP No. 1 seal leak off isolation valves AOV-270A and B fail open on loss of air and can be de-energized or have their instrument air isolated to ensure a seal leak off flow path.

Various fire scenarios have a potential to impact RCP seal cooling. A Westinghouse RCP Passive Thermal Shutdown Seal (SDS) that restricts RCS inventory losses to very low leak rates during a loss of all seal cooling has been installed for each RCP. The SDS limits the leak rates to less than 1.0 gpm for a mission time of 24 hours.

Makeup water to the Reactor Coolant System is also available by use of the Alt RCS system drawing water from a combination of the Spent Fuel Pool and the DI water tank TCD05 since fire damage to cabling can potentially impair Charging and Safety Injection. How the key safety functions (Reactivity Control, Inventory Control and Decay Heat Removal, Reactor Pressure Control, Vital Auxiliaries, and Process Monitoring) are maintained for each fire area are detailed in section 8.0.

## Charging Pumps

Three variable speed positive displacement charging pumps inject coolant into the Reactor Coolant System. At full capacity, each pump is capable of delivering 60 gpm to the RCS.

To ensure that the charging pump flow is always sufficient to meet both the seal water and minimum charging flow requirements, the pump has a variable control stop which does not permit pump flow lower than the specified minimum. This control stop is adjustable to permit higher minimum flow limits to be set if mechanical seal leakage increases during plant life. At minimum flow, each charging pump delivers approximately 15 gpm. The charging pumps require no external supply of cooling water or lubricating oil.

Air pressure regulators are provided in the charging pump room, for pumps not equipped with VFDs, to provide local charging pump speed control.

For the assumed post-fire scenario, makeup water to the Reactor Coolant System will be available by use of the Alt RCS system drawing water from a combination of the Spent Fuel Pool and the DI water tank TCD05 since fire damage to cabling can potentially impair Charging and Safety Injection. How the key safety functions (Reactivity Control, Inventory Control and Decay Heat Removal, Reactor Pressure Control, Vital Auxiliaries, and Process Monitoring) are maintained for each fire area are detailed in section 8.0.

## Refueling Water Storage Tank

In addition to its normal duty to supply borated water to the refueling cavity for refueling operations, the RWST provides borated water to the ECCS pumps.

Various fires can potentially impact the use of the RWST. The Alt RCS system drawing water from a combination of the Spent Fuel Pool and the DI water tank TCD05 is available to mitigate this event.

### 5.1.1.1 *CVCS Alternative Shutdown Capability*

To address alternative shutdown concerns, the control configuration for Charging Pump 1A has been modified by isolating the cable routed to the Cable Tunnel by the operation of a transfer

switch on the Charging Pump 1A local panel. Alternative control is provided by the existing push button "start" and "stop" switches and light indication on the local panel.

Alternative 125V DC control power from Auxiliary Building DC distribution panel 1A1 is supplied to 480V AC Bus 14 with a power feed from a switch at the ABELIP panel. This supply is in addition to the normal control power for ABDP 1A and cross-tie emergency control power from panel ABDP 1B. The normal and the special power control cables are connected to the switchgear Bus 14 control circuit (in addition to the existing automatic throwover through a power transfer switch located on the ABELIP panel.

Alternate air sources for control of charging pump speed are described in the previous section.

The Main Control Room (MCR) abandonment procedure includes PRA credited actions at the shutdown panels (ABELIP and IBELIP) as a backup to monitor plant parameters.

## 5.1.2 Reactor Coolant System

The Reactor Coolant System (RCS) is a Westinghouse two-loop design. Reactor Coolant System instrumentation includes cold- and hot-leg temperature (wide-range), pressure (wide-range), and pressurizer water level.

The natural circulation capability of the plant provides a means of decay heat removal when the reactor coolant pumps are unavailable. Natural circulation flow rates are governed by the amount of decay heat removal, component elevations, primary to secondary heat transfer, loop flow resistance, and voiding.

For this analysis of safe shutdown capability, either RCS loop can be monitored to ensure that natural circulation is established and maintained. However, capability exists to feed both steam generators with auxiliary feedwater. The primary flow path for natural circulation is shown on drawings 33013-1258, -1260, and -1263.

While in natural circulation, adequate heat transfer and coolant flow are dependent on adequate inventory in both the primary and secondary systems. Maintaining water level within the operating band on the secondary side of the "U" tube steam generators and adequate primary inventory are requirements for natural circulation. Confirmation of flow while in natural circulation is accomplished through the use of temperature indications. These indications, $T_{cold}$ ($T_c$) and $T_{hot}$ ($T_h$) (or delta T), should attain a value that is a few degrees higher than the saturation temperature of the secondary inventory. RCS loop differential temperature should attain a value which is less than at full power. When $T_c$ and $T_h$ (or delta T) attain the values described above, flow and heat transfer have been achieved in the associated RCS loops. Subcooling within the RCS is maintained by monitoring RCS pressure and $T_h$ (or delta T).

Reactor Coolant System inventory control is normally based on the operation of the CVCS charging path or Safety Injection System flow path. In the first method, high pressure water from the CVCS system is injected through the normal charging line to the B hot leg. The normal charging flow control valve (HCV-142) fails open on loss of air. However, if plant conditions prevent operation of this valve, the manual bypass valve 384C may be opened. In the second method, coolant water from the Intermediate Head (Safety) Injection System is injected into RCS loop A cold leg through a locked-open motor-operated valve (V-878D) following system depressurization.

A potential fire could impair the normal RCS inventory control operation of the CVCS charging path or Safety Injection System flow path. For the assumed post-fire scenario, makeup water to the Reactor Coolant System will be available by use of the Alt RCS system drawing water from a combination of the Spent Fuel Pool and the DI water tank TCD05. How the key safety functions (Reactivity Control, Inventory Control and Decay Heat Removal, Reactor Pressure Control, Vital Auxiliaries, and Process Monitoring) are maintained for each fire area are detailed in section 8.0.

## Pressurizer Safety Valves

Overpressurization protection of the RCS is assured by two pressurizer code safety valves. The two pressurizer safety valves are spring-loaded, self-activated and have a combined capacity adequate to maintain system pressure below the design limits following a complete loss of load without reactor trip.

## Pressurizer Power-Operated Relief Valves

The Ginna pressurizer has two power-operated relief valves (PORVs) in parallel that provide overpressure protection during normal operating conditions and also during low temperature conditions ($T_{cold}$ less than 330 $^0$F). The valves are three-inch diameter air-operated globe valves. The valves are designated as valves PCV-430 and PCV-431C.

During normal operation, the PORVs open at a set point below the safety valves to reduce RCS pressure and preclude operation of the pressurizer safety valves. Each PORV has a block valve that is remotely operable from the Control Room in order to terminate PORV flow from the pressurizer if the PORV should become stuck open. The PORVs discharge to the pressurizer relief tank (PRT).

Manual and automatic control of the PORVs is accomplished by controlling pneumatic pressure to the valve actuator, supplied by either instrument air or nitrogen gas. Instrument air is used for pneumatic control during normal operations, and nitrogen is used in the low temperature overpressure protection mode. During normal operations, a PORV opens when a solenoid valve in the instrument air line is energized by the pressure controller or by manual control and admits air to the relief valve operator.

The PORV closes when either the pressure controller or manual control de-energizes a solenoid valve in the instrument air line, causing the air from the valve operator to be vented to the atmosphere through the solenoid valve exhaust port. A spring causes closure of the relief valve once the pneumatic pressure has been relieved from the valve operator. During the low temperature overpressure protection mode, the instrument air solenoid valves are de-energized. Control of the PORV actuators is then accomplished by supplying nitrogen to the valve actuator lines by two nitrogen solenoid valves. The four solenoid valves are three-way, diaphragm-operated, pilot controlled valves. These solenoid valves and other associated components are support components for PCV-430 and 431C. The RCS Overpressure Protection, Nitrogen Accumulator System arrangement discussed above is shown on drawing 33013-1263.

A fire inside containment in the pressurizer cubicle area could cause failure of both PORVs since both valves are located in the cubicle with less than 20 feet of separation. As a result, the ability to depressurize the RCS with the PORVs would not be possible. However, a repair

activity has been written to allow local operation of PRZR Aux Spray for pressure reduction. The NFPA 805 licensing basis is to maintain the reactor in a hot shutdown condition (defined as Mode 3, Keff ≤ 0.99, RCS temp ≥350 $^0$F) following any fire occurring with the reactor operating at power. Although, not a licensing commitment, procedural direction has been provided to depressize the RCS if necessary using the repair activity to the pressurizer PORV-430.

### 5.1.3 Main Steam System

For the post-fire scenario, maintenance of the Main Steam (MS) System inventory and control of steam generator pressure is required for hot shutdown. Automatic closure of MSIVs on 2/2 low SG level channels (wide range) OR 2/2 low RCS pressure channels (wide range) is credited for reactor pressure control. Subsequent primary and secondary system cooldown to remove decay and sensible heat within the applicable operational limits also requires inventory and pressure control.

Control of one steam generator is sufficient to provide the reactor decay heat removal function during natural circulation conditions. The MS system flow diagram is shown in drawing 33013-1231.

Maintenance of the steam generator water level involves local control and operation of the Turbine-Driven auxiliary feedwater pump discharge valve and operation of the Turbine-Driven auxiliary feedwater pump. If the Turbine-Driven AFW pump is not available, injection from standby auxiliary feedwater pump C or D will be used to maintain steam generator inventory.

The MS system is also designed to deliver motive steam to the turbine driver of the Turbine-Driven auxiliary feedwater pump. Steam to this turbine is supplied by opening motor-operated valves upstream of the main steam isolation valves located on both steam lines. Either line is sufficient to supply steam for the auxiliary feedwater pump turbine, but two are provided for redundancy.

In various fire scenarios, a fire has the potential for damaging the normal power feeds to the Motor-Driven AFW, TDAFW, and SAFW pumps. To mitigate this event BUS14 and BUS16 are de-energized and the credited recovery action is the alignment of the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water tank TCD05.

#### Safety Valves

A bank of four code safety valves is installed on each main steam header outside containment. The four safety valves on each line are installed to protect the MS system against overpressure and to provide a combined relieving capacity greater than the normal full power steam flow rate of one steam generator. During hot shutdown conditions, the code safeties provide adequate decay heat removal.

#### Atmospheric Relief Valves

A power-operated atmospheric relief valves (ARV) is provided on each steam line which is capable of releasing sensible and decay heat to the atmosphere. The ARVs are used for plant cooldown by steam discharge to the atmosphere. The ARVs each have a relief capacity of approximately 5% of the maximum steam flow of one steam generator. For the assumed fire

scenario, ARV's will be used to cooldown the Reactor Coolant System.

Controls for the steam generator ARVs are provided in the Control Room. Motive force is normally supplied by instrument air. However, on loss of instrument air, there is a bank of nitrogen bottles that automatically supplies the force to open the ARVs. Should a fire effect remote control capability from the control room, the ARVs can be locally operated via a hand wheel to remove decay heat from the RCS. By maintaining the steam generator at the corresponding saturation pressure, the temperature of the RCS can be controlled.

## 5.1.4 Auxiliary Feedwater System

The Auxiliary Feedwater (AFW) System is required during hot shutdown fire scenarios for steam generator makeup control, and for RCS lowering temperature control. Controlling AFW flow during hot shutdown fire scenarios aides in RCS lowering temperature control. The AFW system consists of the Turbine-Driven auxiliary feedwater pump, two Motor-Driven auxiliary feedwater pumps, and two standby auxiliary feedwater pumps. The two Motor-Driven auxiliary feedwater pumps are ~~not evaluated in this analysis since they~~ are located next to the TDAFW pump in the same fire area. Each Standby AFW pump and the Turbine-Driven pump have the capability of providing the rated flow against a steam generator pressure of the lowest steam generator safety valve set point.

Design Analysis DA-ME-2000-001 documented the capability of the city water loop to provide water to the SAFW pumps if needed. The use of the underground yard fire water loop to supply AFW has been previously approved by the Staff under the Ginna Systematic Evaluation Program (SEP). Various correspondence between RG&E and the Staff documents the acceptance of this method.

The AFW system is designed to deliver enough water ~~(200 gpm or less)~~ to maintain sufficient heat transfer in the steam generators to prevent overpressurizing the RCS and lifting the pressurizer safety or relief valves. The Auxiliary Feedwater System flow paths are shown on drawings 33013-1234, -1237, and -1238. Any fire affecting the TDAFW pump would also affect the MDAFW pumps.

In various fire scenarios, a fire has the potential for damaging the normal power feeds to the Motor-Driven AFW, TDAFW, and SAFW pumps. To mitigate this event BUS14 and BUS16 are de-energized and the credited recovery action is the alignment of the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water tank TCD05.

### Turbine-Driven Auxiliary Feedwater Pump

The Turbine-Driven auxiliary feedwater (TDAFW) pump is a horizontal, multistage, diffuser-type centrifugal pump. It is driven by a single-stage noncondensing steam turbine. Upon opening the steam inlet valve, the turbine will function as a single speed machine.

Both steam generators can provide motive steam to the turbine driver for the auxiliary feedwater pump. The TDAFW pump is capable of operating down to at least a steam pressure that corresponds to RCS pressure and temperature at which the Residual Heat Removal System may be placed in service.

The initial supply of water to the TDAFW pump is from the condensate storage tanks (CST).

In various fire scenarios, a fire has the potential for damaging the normal power feeds to the Motor-Driven AFW, TDAFW, and SAFW pumps. To mitigate this event BUS14 and BUS16 are de-energized and the credited recovery action is the alignment of the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water tank TCD05.

## Standby Auxiliary Feedwater Pumps

The purpose of the standby auxiliary feedwater (SAFW) system is to back up the Auxiliary Feedwater System in the event of loss of the turbine and Motor-Driven AFW pumps. This system is independent of the turbine and Motor-Driven auxiliary feedwater systems.

The standby auxiliary feedwater system consists of two multistage centrifugal type Motor-Driven pumps, a de-ionized condensate storage tank capable of providing 24 hours of decay heat removal (reference 1.2.14), a dedicated diesel generator, and associated piping, valves, and instrumentation. The water supply to the SAFW system is from the outside de-ionized condensate storage tank, or from the city water yard loop or service water system (Lake Ontario). The preferred water supply is the outside de-ionized condensate storage tank, since its water source is chemically controlled to reduce corrosion and fouling in the steam generators.

Each of the two Motor-Driven pumps in the SAFW system delivers emergency feedwater to one of the steam generators through piping connected to the main feedwater lines inside containment. The piping system provides the capability for the pumps to deliver water to either steam generator through the use of remotely operated cross-over valves between the two pump discharge lines. Each of the two pumps has 100% capacity and can develop a head sufficient to ensure that feedwater at a rate of 215 gpm can be injected into the steam generator when steam generator pressure is at the lowest setpoint of the safety valves plus accumulation. As is the case with the Auxiliary Feedwater System, the SAFW system operates down to the steam generator pressure at which point the Residual Heat Removal System can be operated. Each standby auxiliary feedwater pump motor has the capability of being supplied from the redundant emergency electrical system.

There are also two 1MW diesel generators (100% redundant for failure to start) feeding a common switchgear that can be manually aligned. One is in the enclosure building and one is outside. These generators are EACH capable of simultaneously providing power to:

- Run at a minimum one SAFW pump
- Run the single-electrically driven Alternate RCS pump,
- Provide power to charge both station batteries
- There are no provisions to re-power SAFW room cooling with this arrangement

### 5.1.4.1 *AFW and Primary Control Station IBELIP*

The Turbine-Driven AFW pump, for purposes of this analysis, is dependent only upon DC power for operation of the turbine driven auxiliary oil pump and service water for cooling. An

isolation switch is provided to isolate applicable control circuits. A local start/stop switch is available near the Turbine-Driven AFW pump to provide for local operation.

Local control capability is provided for the TDAFW pump common DC discharge valve, MOV-3996. The remote/local transfer switch and the local valve control switch are in the IBELIP. This allows the operator to directly monitor S/G levels while adjusting feed flow. Flow to individual S/G's can be controlled by throttling TDAFW Pump Flow Control Valve AOV-4297 or AOV-4298, outlet block valves, if necessary.

IBELIP is only used as a backup to monitor plant parameters and is not credited in the licensing basis.

### 5.1.5 Safety Injection System

The Safety Injection (SI) System can accomplish the same safety functions as the charging portion of CVCS (see Subsection 5.1.1). The principal components of the SI system are three intermediate head safety injection pumps, the refueling water storage tank, and associated pipes and valves.

The three intermediate head safety injection pumps have a shutoff head of approximately 1500 psig. Because of this, the PORVs will be used to reduce system pressure below the shutoff head value to allow for injection.

For this scenario, Safety Injection Pump 1B, powered from 480V AC emergency power Bus 16, is aligned to the RWST for pump suction. Injection is then made through a normally locked-open motor-operated valve into RCS loop A cold leg.

The SI flow path is shown on drawings 33013-1261 and 33013-1262, Sheets 1 and 2. Valves in the injection path are normally locked-open manual valves or motor-operated valves locked-open with breakers racked out. The pump will be cycled on and off to maintain inventory. Prior to operation of the Safety Injection System, V-897 and V-898 are verified open to ensure recirculation capability and prevent damage to the pumps at low flow.

A fire in various areas may damage all three safety injection pumps and the control and power feeds to all three charging pumps. To mitigate this event, a recovery action to locally align and start the Alternate RCS Injection System is used. The Alt RCS Injection System such is a combination of the use of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

**<u>Accumulators</u>**

The accumulators are not credited for hotshut down for any fire scenario and were not credited in the NFPA 805 NSCA (reference 1.2.1 and 1.2.21).

The NFPA 805 licensing basis is to maintain the reactor in a hot shutdown condition (defined as Mode 3, Keff $\leq$ 0.99, RCS temp $\geq$350 $^{0}$F) following any fire occurring with the reactor operating at power.

The manual isolation of the accumulators is a post-fire cold shutdown activity. The isolation valve at each accumulator is closed only when the RCS is intentionally depressurized below 1000 psig. If the associated cables of these valves are damaged by a fire, the isolation will be

performed locally, governed by post-fire plant procedures.

## 5.1.6 Residual Heat Removal System

The Residual Heat Removal (RHR) System is designed to remove residual and sensible heat from the core and reduce and maintain the temperature of the RCS following plant shutdown. The RHR system flow path is shown on drawing 33013-1247.

The RHR system consists of two RHR heat exchangers, two RHR pumps and the associated piping, valves, and instrumentation necessary for operational control. The breakers for the RHR pumps (52/RHRP1A and 52/RHRP1B) and the RHR pumps (PAC01A and PAC01B) were included in the NSCA SSEL (reference 1.2.1 and 1.2.21) for the de-energization of the RHR pumps to control decay heat removal for hot shutdown.

The NFPA 805 licensing basis is to maintain the reactor in a hot shutdown condition (defined as Mode 3, Keff $\leq 0.99$, RCS temp $\geq 350\ ^0$F) following any fire occurring with the reactor operating at power.

During cold shutdown operations, reactor coolant flows from the RCS to the RHR pumps through the tube side of the RHR heat exchangers and back to the RCS. The heat load is transferred by the RHR heat exchangers to the Component Cooling Water System, which is circulating on the shell side of the heat exchangers. The inlet line to the RHR system is located in the hot leg of RCS loop A while the return line is connected to the cold leg of RCS loop B.

Two motor-operated valves in series isolate the inlet line to the Residual Heat Removal System from the Reactor Coolant System. A pair of motor-operated valves in series also isolate the return line back to the RCS. To avoid potential RCS boundary leakage at this high/low pressure interface, the motor-operated valves in both RHR suction and discharge lines are kept closed (pre-fire condition) with the corresponding motor control center breakers locked in the off position.

The cooldown rate of the reactor coolant is controlled by regulating flow through the tube side of the RHR heat exchangers.

The RHR system can be placed in operation when the pressure and temperature of the RCS are less than 400 psig and 350 $^0$F, respectively.

RHR system V-694A, V-694B, V-696A and V-696B are locked open to ensure recirculation capability and prevent damage to the pumps at low flow.

### Residual Heat Removal Pumps

Two identical pumps are installed in the Residual Heat Removal System. Each pump is sized to deliver sufficient reactor coolant flow through a residual heat exchanger to meet the plant cooldown requirements. The breakers for the RHR pumps (52/RHRP1A and 52/RHRP1B) and the RHR pumps (PAC01A and PAC01B) were included in the NSCA (reference 1.2.1 and 1.2.21) for the de-energization of the RHR pumps to control decay heat removal for hot shutdown.

### RHR Overpressure Protection

Motor-operated valves with pressure interlocks isolate the residual heat removal loop from the

Reactor Coolant System. Overpressure in the residual heat removal loop is provided through a relief valve in the low pressure letdown section of the Chemical and Volume Control System.

Letdown isolation valves 371, orifice valves (200A, 200B, and 202), and 427, are credited in the NSCA for isolation function for inventory control for hot shutdown (reference 1.2.1 and 1.2.21). The spurious operation of these valves is assumed to clear based on NUREG/CR-7510, EPRI 3002001989.

#### 5.1.6.1 *Water-Solid Steam Generator Operation(cold shutdown activity)*

This condition is associated with cold shutdown activities which are not analyzed for at-power conditions because safe and stable conditions were redefined as Hot Shutdown for the current NFPA 805 license.

If the RHR system or its associated support systems are damaged by a fire, Water Solid steam generator operation can be employed. This procedure was described in detail in a submittal previously transmitted to the Staff[4] and approved in a Staff-issued SER[5]. Water solid steam generator operation is employed by:

- Pinning the main steam supports to carry the additional water weight
- Cooling the RCS to an average temperature of approximately $260^0$F by steaming the S/G with the use of ARV
- Once $260^0$F is reached, each S/G is filled up into the main steam line utilizing two Standby AFW pumps
- Drain path piping is connected to each main steam header and water is drained to the blowdown tank and subsequently to the discharge canal via the blowdown system.
- Drain valves on each main steam header can also be opened and water is drained to the turbine building floor drains

This method can cool the RCS to less than $200^0$F in less than 72 hours.

Design Analysis FTI Calculation 32-5009845-00 was completed and documents that SG water solid cooling is capable of bringing the plant to Mode 5 conditions 72 hours after a postulated fire event. Stone & Webster analysis 109682-M-012 confirmed that at EPU conditions water solid SG cooling can bring the RCS to Mode 5 within 72 hours. PCR 2003-0014 provided a drainage path from SG B Main Steam Line to the Blowdown Tank. PCR 2005-0025 provided a drainage path from SG A Main Steam Line to the Blowdown Tank.

### 5.1.7 Component Cooling Water System

The Component Cooling Water (CCW) System is designed to:

1. remove residual and sensible heat from the reactor coolant system, via the residual heat removal loop, during plant shutdown;
2. cool the letdown flow to the Chemical and Volume Control System during power operation, and,
3. provide cooling to dissipate waste heat from various primary plant components.

The CCW system operates with two component cooling pumps and two component cooling

heat exchangers. The CCW flow path is shown on drawing 33013-1245.

During normal full power operation, one component cooling pump and one component cooling heat exchanger accommodate the heat removal loads. The standby pump and heat exchanger provide 100% backup during normal operation. Two pumps and two heat exchangers are normally utilized to remove the residual and sensible heat during cooldown.

Loss of CCW flow challenges the vital auxiliaries Nuclear Safety Performance Criteria credited in the NSCA for hot shutdown. The primary CCW components in the NSCA include the CCW heat exchangers, CCW pumps, associated valves, and breakers (reference 1.2.1 and 1.2.21).

The essential loads, other than the residual heat exchangers, are normally valved open to the supply header. The loads discharge to the suction of the component cooling water pump. Component cooling water is circulated continuously through the essential loads during normal operation. For the present analysis of safe shutdown, isolation of non-essential loads is not required for safe shutdown.

Each of the CCW inlet lines to the residual heat exchangers has a normally closed motor-operated valve that can be locally opened during RHR cooldown.

**Component Cooling Water Pumps**

The two component cooling water pumps, which circulate component cooling water through the component cooling loop, are horizontal, centrifugal units. The two component cooling water pumps deliver flow to the shell side of the residual heat exchangers.

**Component Cooling Heat Exchangers**

The component heat exchangers are of the shell and straight tube (fixed tubesheet) type. Service water circulates through the tubes while CCW circulates through the shell side. Normally one heat exchanger is used during normal operation.

### 5.1.8 Service Water System

The Service Water (SW) System consists of four pumps, a loop header, and isolation valves. A loop header system is provided to supply cooling water to essential and nonessential loads. Service water supply to essential loads is redundant and can be maintained in case of failure of one loop section header. These components, together with the associated heat exchangers, valves, piping and local instrumentation, complete the Service Water System. Lake Ontario is the source of service water.

The Service Water System is credited in the NSCA for vital auxiliaries and decay heat removal for hot shutdown. The primary SW components in the NSCA include the service water pumps, SW valves associated with the SAFW room coolers, TDAFW pump suction and lube oil cooler, and strainer by-pass valve, service water isolation valves to SAFW pumps, containment recirc fan coolers, and Emergency Diesel Generators heat exchangers, Screen House SW MOVs, Aux Building SW MOVs, and Turbine Building SW MOVs (reference 1.2.1 and 1.2.21).

The system also provides a back-up supply of water to the Turbine-Driven AFW system in the event that the condensate storage tanks are depleted, and a long term supply of water to the Standby AFW system. The service water flow path is shown on drawings 33013-1250, Sheets1 and 2.

The service water lines to the Auxiliary Building supply cooling water primarily to the two component cooling heat exchangers and the spent fuel pool cooling system. These heat exchangers are utilized to remove residual heat from the RCS and spent fuel pool through the intermediate component cooling water loop. The residual heat removal loop is employed during normal shutdown operations.

The Service Water System has been designed to provide redundant cooling water supplies with isolation valves to the containment coolers, reactor compartment coolers, diesel generators, component cooling heat exchangers, the spent fuel pool cooling system and other necessary loads.

The system is sized to ensure adequate heat removal based on highest expected temperatures of cooling water, maximum loadings, and leakage allowances. The system is monitored and operated from the Control Room. Isolation valves are incorporated in service water lines penetrating the containment.

To preclude the possibility of an inadvertent blockage of service water supply to the Turbine-Driven AFW pump and emergency diesel generators, there are no automatically operated valves between the lake and the Turbine-Driven pump. MOV 4013 requires manual action as noted on drawing 33013-1237.

ECP-2008-0040 installed two parallel [ fail open ] air operated service water isolation valves on the upstream side of the Diesel Generator lube oil and jacket water coolers for each Diesel Generator. This allows for the service water to be secured to the diesel generator lube oil and jacket water coolers when the Diesel Generator is not running. This will prevent undesired premature fouling and erosion of the lube oil and jacket water coolers that had previously occurred when service water flow through them was continuous. Both air operated valves automatically open on a Diesel Generator start signal. A parallel manual bypass valve was also installed to allow bypassing the two AOV's for service water water flow to the lube oil and jacket water coolers if required. Reference drawing 33013-1250, sheet 1.

### Service Water Pumps

Four electric, Motor-Driven, vertical two-stage service water pumps are provided. Each service water pump has a capacity of 5300 gpm. Two service water pumps are connected to one emergency 480V AC bus, and the remaining two pumps are connected to the other emergency 480V AC bus. One of the four pumps is capable of supplying the required flow to cool safe shutdown loads (Reference DA-ME-98-138).

## 5.1.9 Emergency Power System

The basic components of the Emergency Power System are shown on the 480V Electrical One-Line Diagram (drawing 33013-652). In the event of an occurrence causing loss of the 115kV off-site power connections, the station can be supplied from one of the two emergency diesel generators (EDG).

The two emergency diesel generator sets each consist of an Alco model 16-251-E engine coupled to a Westinghouse 1950kW, 480V 0.8 power factor, 900 rpm, 3-phase, 60 cycle generator. The units have a capability of 2300kW for a 30-minute period, 2250kW for a two-hour period, and 1950kW continuous.

Each unit, as a backup to the normal AC power supply, is capable of sequentially starting and supplying the power requirement of one complete set of safeguards equipment.

Each emergency diesel is automatically started by an air motor, each unit having a complete 20 cubic foot air storage tank and compressor system powered from the opposite train 480V AC emergency bus. The piping and the electrical services are arranged so that manual transfer between units is possible. Each air receiver has sufficient storage for up to a 45-second cranking cycle, equivalent to five starts. The emergency unit is capable of being started and supplying 1/3 load after ten seconds. It can be fully loaded 30 seconds after the initial starting signal. To ensure rapid start, the units are equipped with water jacket and lube oil heating and pre-lube pump for circulation of lube oil when the unit is not running.

A fuel storage day tank is located at each of the units. This minimum diesel fuel oil inventory is maintained to assure that both diesel generators can operate at their design ratings for 24 hours. This assures that both diesel generators can carry the design loads of required engineered safeguards equipment for any loss of coolant accident conditions for at least 40 hours, or for one engineered safety feature train for 80 hours. Commercial oil supplies and trucking facilities exist to assure deliveries of additional fuel oil within 8 hours. Transfer of oil from the underground storage tank to the day tank is accomplished automatically by two Motor-Driven pumps. Each pump can supply either day tank through manual valve alignment.

Emergency diesel generator (EDG) 1A is connected to 480V switchgear Buses 14 and 18. EDG 1B is connected to 480V switchgear Buses 16 and 17. Each set will be automatically or locally started and placed on the line upon under-voltage on one of the 480V buses associated with the set.

## 4160 Volt and 480 Volt Systems

The 480V system, shown on drawing 33013-652, includes 480V switchgear which are divided into six independent buses. The 480V buses are supplied from the 4160V buses as follows: Bus 14 via a station service transformer supplied from Bus 12A; Bus 18 via a station service transformer supplied from Bus 12A; Bus 16 via a station service transformer supplied from Bus 12B; Bus 17 via a station service transformer supplied from Bus 12B; Bus 13 via a station service transformer supplied from Bus 11A; Bus 15 via a station service transformer supplied from Bus 11B. Tie breakers are provided between 480V AC Buses 14 and 13, Buses 14 and 16, Buses 16 and 15, and Buses 17 and 18.

Train A of the required safeguards equipment is supplied from the 480V AC Buses 14 and 18. Train B is supplied from 480V AC Buses 16 and 17. No transformer is required in the event of an incident requiring safeguards actuation since power will be supplied from the EDGs. EDG 1A supplies Buses 14 and 18 and EDG 1B supplies Buses 16 and 17.

The 4160V System is credited in the NSCA for vital auxiliaries. The primary 4160V components in the NSCA include BUS 11A, 11B, 12A, 12B, and associated breakers for BUS 11A, 11B, 12A, 12B (reference 1.2.1 and 1.2.21).

The 480V System is credited in the NSCA for vital auxiliaries. The primary 480V components in the NSCA include the BUS, breakers, and tie breakers for 13, 14, 15, 16, 17, 18, MCCA, MCCB, MCCD, MCCG, MCCH, MCCJ, MCCL, MCCM, MCCN, MCCP, TSC Auto transfer switch, Auxiliary Building, TSC, Turbine Building, and Control Building Power Distribution panels, CREATS lighting panels, Battery Charger A1 and B1, TSC Battery Charger, and TSC

Emergency Diesel Generator (reference 1.2.1 and 1.2.21).

## 125 Volt DC System

The 125V DC system, shown on drawing 03202-0102, supplies power for operation of 4.16kV and 480V emergency switchgear, the emergency diesel generators, logic and control circuits and essential instrumentation (through two static 120V AC inverters). There are two independent 125V ungrounded two-wire systems each with a 60 cell, lead calcium 125V DC battery, rated at 1495 amp hours. Each station battery is capable of supplying DC power for at least 4 hours at full load without charging (Reference DA-EE-97-069). The two station batteries are located in the basement of the Control Building area. The batteries are physically separated by a two-hour barrier.

The 125V DC system is divided into two independent distribution systems. Each 125V DC system includes one main fuse cabinet composed of two sections, two battery chargers and one main DC distribution panel. The main DC distribution panels supply 125V DC power to local DC distribution panels. The Turbine Building DC distribution panel has its supply from Main Fuse Cabinet 1B.

The train A safeguards equipment is supplied from battery A while train B safeguards equipment is supplied from battery B. In addition, the 480V AC safeguards switchgear are supplied from either battery by means of an automatic transfer circuit in the switchgear. The normal supply from train A (switchgear Buses 14 and 18) is from the 1A DC distribution panels located in the Auxiliary Building and the Screen House. These panels can also provide the emergency DC supply for train B (switchgear Buses 16 and 17). No credit is taken in the analysis for the emergency DC feeds to the vital buses. Similarly located, the 1B DC distribution panels provide the normal supply for switchgear Buses 16 and 17. Fuse coordination precludes the loss of power to a bus in the event that a fault internal to the redundant bus is automatically transferred to the power supply of the first bus.

Each 125V DC system includes two battery chargers. The battery chargers supply the normal DC loads, as well as maintaining the proper charge on the batteries, through the main fuse cabinets (Section 1) and main DC distribution panels.

The 125V DC System is credited in the NSCA SSEL for vital auxiliaries. The primary 125V DC components in the NSCA SSEL include Battery and Battery Charger A/B, TSC battery Auxiliary Building, Main Control Board, Emergency Diesel Generator A/B, Screen House, DC distribution panels, Turbine Building DC distribution panels, Battery A, B, and TSC disconnect panels, Battery A and B main fuse cabinets, and TSC to Battery A and B throwover switch panel (reference 1.2.1 and 1.2.21).

## 120 Volt AC System

The l20V AC instrument supply is split into four instrument Buses: lA, lB, lC and lD as shown on drawing number 0320l-0102. Buses lA and lC are normally fed by inverters which are, in turn, supplied from separate 125V DC buses. In the event of loss of DC power or inverter failure, static transfer switches power these buses from constant voltage transformers on 480V AC Buses l4 and l6 respectively. The other two instrument buses are normally supplied by constant voltage transformers supplied by separate 480V buses.

The 120V AC System is credited in the NSCA for vital auxiliaries. The primary 120V AC components in the NSCA SSEL include ABELIP, IBELIP, instrument BUS A, B, C, and D, instrument BUS B and D constant voltage transmitters, instrument BUS A and C inverter/transformer, Foxboro instrument racks, instrument power distribution panels A, B, C, and D, reactor protection instrument rack Y2 inverter, reactor vessel level monitor rack 1 and 2, and SAFW pump C and D instrument panels (reference 1.2.1 and 1.2.21).

#### 5.1.9.1 *Emergency Local Control Panel (ELCP)*

EDG lA has been modified to allow for local control thus ensuring its operability under alternative shutdown scenarios. EDG control and control power cables are interrupted (isolated) by an isolation switch. This switch is installed in Fire Area EDG1A on the EDG 1A Emergency Local Control Panel (ELCP) for local diesel operation.

Alternative instrumentation at the diesel generator station include voltmeter, ammeter, diesel generator speed indicator (tachometer). These alternate controls include manual and automatic speed and voltage controls, mode selector switches, start and stop controls and required reset switches.

In addition to this modification for EDG lA, a new breaker was installed between EDG lB and 480V AC Bus l7 (located in the Screen House) for protecting against both EDGs failing due to a fire-induced circuit failure at Buses l7 and l8.

For certain fire scenarios, the Service Water System may be damaged and water supply to cool the diesel generators may be lost. In such a case, the underground yard fire water supply would be used. The use of the underground yard fire water loop to cool the diesel generators has been previously approved by the Staff under the Ginna Systematic Evaluation Program (SEP). Design Analysis DA-ME-2000-00l documented the capability of the city water yard loop to provide cooling water to the EDGs if required.

In the event of a fire damaging the normal plant battery charger supply, and subsequent depletion of station batteries, the recovery action is to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term.

### 5.1.10 Process Monitoring System

The plant process parameters are:

1. Primary system, cold and hot leg (or delta T) temperature,
2. Primary system pressure,
3. Pressurizer level,
4. AFW flow,
5. CVCS and SI flow,
6. Steam generator pressure and level,
7. Source range neutron monitoring, and,

8. CST and RWST level.

These indications are dependent on field equipment that requires electrical power (typically 120V AC from inverters powered from the 125V DC power system). The instrument channels have remote indication in the Control Room and in some cases in remote locations in the plant.

### 5.1.10.1 *Process Monitoring System Main Control Room*

The Main Control Board includes the following process instrumentation:

1. RCS Temperature (TI-409B-1 or TI-410B-1)
2. RCS Pressure (PI-420A or PI-420-2)
3. Pressurizer Level (LI-426, LI-427, or LI-428)
4. Steam Generator Level (Steam Generator A: Narrow range LI-461, LI-462, or LI-463. Wide range LI-504 or LI-505) (Steam Generator B: Narrow range LI-471, LI-472, or LI-473. Wide range LI-506 or LI-507)
5. Steam Generator Pressure (Steam Generator A: PI-468, PI-469, or PI-482A) (Steam Generator B: PI-478, PI-479, or PI-483A)
6. Neutron Flux (NI-41B or NI-43B)
7. Tank Level (Condensate Storage Tank LT-2022A or LT-2022B) (RWST LT-920 or LT-921)
8. AFW Flow (TDAFW FI-2031)

An additional panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels, contains indication from two Reactor Coolant System pressure channels (wide range) PI-421 and PI-422, and from two steam generator level channels (wide range) LI-509 and LI-510.

### 5.1.10.2 *Process Monitoring System Outside Main Control Room (Primary Control Stations)*

Process instrumentation at the Primary Control Stations is identified below. The transmitters are pneumatically interfaced and mounted adjacent to the existing transmitters that provide signal to the control room indicators. The instrumentation signals are independent of, and separated from, the existing Class 1E loops.

The Intermediate Building Emergency Local Instrument Panel (IBELIP) includes the following indications:

1. RCS loop temperature (TI-409A-2, TI-409B-1)
2. Turbine-driven AFW flow (FI-2015A)
3. Steam generator level (Steam Generator A LI-460AA) (Steam Generator B LI-506A)
4. Steam generator pressure (Steam Generator A PI-469A)
5. Steam Generator level (LI-506A)*

Power for the alternative instrumentation loops is provided from a separate feed using a spare breaker in the Turbine Building DC distribution panel. This feed supplies a static inverter (internal of the panel) producing 120V AC instrument power.

* Steam Generator wide range level (LI-506A) at IBELIP would not be available to support safe

shutdown with a fire in the control complex. LI-506A utilizes Loop LT-506 Signal input and power supply located in the RVLMS1 rack.
LI-506A is not independent and seperate from existing loop 506, nor does it contain a seperate power supply. LI-460AA (Steam Generator A) level function is not impacted by a control room fire).

The Auxiliary Building Emergency Local Instrument Panel (ABELIP) includes the following indications:

1. Primary pressure (PI-420B*), and
2. Pressurizer level (LI-428A*).

* These components are considered unavailable to support SSD for a fire in area ABBM, BR1B, Control Complex, Cable Tunnel, and Reactor Containment.
Power for the alternative instrumentation loops is provided from the Auxiliary Building DC distribution panel 1A2. This feed supplies a static inverter (internal to the panel) producing 120V AC instrument power.

A spare source range monitor drawer has been located on-site in the Intermediate Building. This drawer can be connected to one of the existing source range detectors (i.e., N32) located inside containment. The connection will be made outside containment at the IBN penetration area where the detector circuits penetrate containment. The drawer is totally portable and uses an undamaged power source from the IBELIP for its supply.

ABELIP and IBELIP is only used as a backup to monitor plant parameters and is not credited in the licensing basis.

## 5.1.11 Ventilation Systems

Safe Shutdown ventilation requirements have been analyzed to determine those areas that will require supplemental cooling in order to maintain system operation for an extended period of time post- fire. The following subsections discuss post-fire ventilation requirements for Ginna Station.

### 5.1.11.1 *Auxiliary Building*

Auxiliary Building HVAC is not required for safe shutdown (Reference Altran Technical Report No. 99124-TR-001, dated 10/99). Auxiliary building consists of below grade structure with metal sided top floor with high ceilings. Building HVAC is not provided for any safety related functions. The referenced analysis evaluated the auxiliary building heat up transient that resulted from a loss of auxiliary building HVAC concurrent with a design basis LOCA. The results of the analysis determined that with a LOCA postulated event, auxiliary building temperatures remained in the $104^0$F range over a 24 hour period. For the assumed fire scenario, the heat loads are expected to be less since less equipment would be running for the safe shutdown scenario thereby reducing the heat loads.

### 5.1.11.2 *Battery Rooms*

Battery Room HVAC is not required for safe shutdown (Reference Devonrue Calculation No. DRRGE 9312, dated 12/1/93).

Ventilation capability for hydrogen build-up concerns is addressed in DA-EE-99-068 which determined that hydrogen concentrations would remain below the 2% level for up to 66 hours without room ventilation. Beyond this point, opening of room doors would relieve the build-up.

### 5.1.11.3 *Cable Tunnel*

The cable tunnel is not provided with installed ventilation capability. The cable tunnel is located entirely below grade with interfaces to the Intermediate Building, Auxiliary Building, Turbine Building and control building ventilation room. Minimal heat rejection by cables in the tunnel negate the need for ventilation.

### 5.1.11.4 *Charging Pump Room*

Charging Pump Room HVAC is not required for safe shutdown. It should be noted that in 1999 (under Work Order 1940020) the service water-cooling coils for both units were replaced over a ten-day period. These activities required that the recirculation units be held and space temperatures be monitored while the work was in progress. It was confirmed that at no time during these activities did space temperatures exceed design limits. As such operation of the charging pump room coolers are not considered to be required for post-fire safe shutdown.

### 5.1.11.5 *Control Room*

The function of the control room area ventilation system is to provide a controlled environment for the safety and comfort of control room personnel and to ensure the operability of control room components during normal operating, anticipated operational transient, and design-basis accident conditions. The control room area ventilation system design is shown in Drawing 33013-1867 and is described in UFSAR section 6.4.

Except for a Control Room fire, the Control Room Emergency Air Treatment System (CREATS) is used for controlling the Control Room environmental conditions. Note that the loss of control room HVAC has no adverse effect in the Fire PRA other than increasing human error probabilities of human failure events. No recovery action is credited for safe shutdown.

### 5.1.11.6 *Reactor Containment*

Reactor containment HVAC is not required for safe shutdown (Reference WCAP 10541). This analysis evaluated the containment pressure and temperature effects due to a loss of all A/C with RCP leakage through the PRT rupture. The containment temperature reaches a steady state maximum temperature of less than $130^0$F which is below the loop design temperature of $286^0$F with no fans operating. The NSCA (reference 1.2.1 and 1.2.21) does not credit the reactor containment HVAC for hot shutdown.

### 5.1.11.7 *Diesel Generator Rooms*

The diesel generator rooms requires HVAC to support their operation and is credited in the NSCA (reference 1.2.1 and 1.2.21). The diesel generators and associated electrical switchgear are housed in adjacent but separate rooms; each serviced by a ventilation system. Each room is equipped with two ventilation inlet supply fans drawing outside air. Each fan takes suction from a common header and discharges through separate ductwork, dampers and diffusers. One fan in each room discharges a supply of air directly on the instrument and control cabinets. Excess air is discharged to the outdoors through automatic, pressure actuated room vents, backdraft dampers, and wall mounted louvers.

When the diesels are not running, the outlet damper in each line is held closed by an instrument

air solenoid valve associated with each damper. A diesel generator start signal automatically opens the dampers and starts one of the two supply fans with normal operating room temperatures. Power to actuate the solenoid valves is provided by the 125V DC system through breakers in each room. Once opened, the dampers remain open until the diesel generator is turned off. The dampers fail in the open position upon loss of instrument air and remain as such until air pressure is restored and the diesel is no longer operating. This ensures that the dampers are in their safe position upon diesel start to provide adequate cooling.

A diesel generator start signal starts one of the two room supply fans dedicated to switchboard cooling with normal operating room temperatures. The second supply fan starts when the diesel is running and the room temperature reaches a thermostat setpoint ($90^0$F). This second supply fan directs air near the engine jacket water sensing line. The sensing line in each room is equipped with a thermostat that delays starting the fan until sufficient heat is rejected by the diesel engine to prevent freezing the line in cold weather. Additional protection is provided by a second set of thermostat switches which will turn off the automatic supply fan on D/G room low temperature ($40^0$F). The fans in Diesel Generator Room A are powered from a motor control center that is powered from Diesel 1A via Bus 14. The fans in Diesel Generator Room B are powered from an MCC that is powered by Diesel 1B via Bus 16.

For fires that potentially impact the D/G HVAC system and negatively impact the Diesel Generators for safe shutdown, the use of the NFPA or SAFW 1MW Diesel Generator is the mitigation strategy.

### 5.1.11.8 *Intermediate Building*

Intermediate Building HVAC is not required for safe shutdown due to the area configuration and is not credited in the NSCA (reference 1.2.1 and 1.2.21). Building features are such that heat build-up due to the operation of the TDAFW pump will rise through the areas of open grating to upper elevations and away from the TDAFW pump and the IBELIP. In addition, the roll-up fire door at the interface with the turbine building basement provides a source of cooling air to the immediate area of the IBELIP panel. If needed, a set of double doors at the 315 foot elevation of the intermediate building to the exterior can be opened to maximize the stack effect and heat removal capability.

### 5.1.11.9 *Relay Room*

Relay Room HVAC is not required and is not credited for safe shutdown (Reference Devonrue Calculation No. DRRGE 9312, dated 12/1/93), and is not credited in the NSCA (reference 1.2.1 and 1.2.21). RG&E performed a relay room heatup calculation as part of the station blackout and determined that the steady state temperature would be excessive even with the relay room doors open.

During the 1999 refueling outage, the relay room HVAC system was removed from service and portable ventilation fans were utilized. Relay room temperature remained less than $85^0$F with outside temperatures at approximately $70^0$F. Portable ventilation fans with temporary flexible duct could be utilized to maintain the relay room less than design limits.

### 5.1.11.10 *Screenhouse*

Screenhouse HVAC is not required for safe shutdown, and is not credited in the NSCA (reference 1.2.1 and 1.2.21), since building features such as very high ceilings on the top floor, metal siding structure with significant operable windows and the availability of large overhead

doors would minimize building heatup.

### 5.1.11.11 *Standby Auxiliary Feedwater Pump Room*

The Standby Auxiliary Feedwater Pump (SAFWP) room pumps require HVAC to support their operation and is monitored under the NFPA 805 monitoring program. Specifically, the HVAC equipment in the NFPA 805 monitoring program includes the SAFW General Area inlet dampers AFD03 and AFD04, along with exhaust dampers AFD05 and AFD06. The Standby Auxiliary Feedwater Pump (SAFWP) room, whose contents include two standby auxiliary feedwater pumps and their electric drive motors, as well as portions of the Alternate RCS system is part of the standby auxiliary building addition. The SAFWP room cooling system provides cooling required to maintain the pump room within the maximum ($120^0$F) design temperature range. It should be noted that the SAFWP room coolers are not required for operability of the pumps for room temperatures below $80^0$F.

The SAFWP room cooling system, if available, or the portable ventilation equipment is used if the room temperature is greater than $80^0$F. The cooling system provides recirculation air cooling required for continuous operation of the pump motors. A given cooling unit is automatically started whenever the corresponding pump is started. The two fan drive motors for the cooling units are supplied from separate, redundant Class 1E electrical systems. Service water provides the cooling medium for each unit.

The SAFW building corridor was provided with portable ventilation equipment for use in the event the primary power supplies for the room cooler fans are not available. Design Analysis DA-ME-2000-096 provides the basis for the acceptability of the portable ventilation equipment to support the operation of the SAFW building equipment.

### 5.1.11.12 *Technical Support Center Diesel Generator Room*

The TSC ventilation system is credited in the NSCA (reference 1.2.1 and 1.2.21). The only area of concern for safe shutdown in the Technical Support Center is the diesel generator room. The room contains the TSC emergency diesel generator, day tank and pump. The cooling system for the room is provided via outside air by means of an exhaust fan. The diesel generator room exhaust fan and air intake dampers are controlled by a room thermostat when the diesel is not operating. When the diesel is operating, the room exhaust fan is off, but both air intake dampers are open and the diesel generator skid exhaust fan operates. The TSC Battery and Inverter rooms are provided with roof exhaust fans and wall fans to circulate air between the diesel room, inverter room and the battery room. Hydrogen build-up in the bat- tery room is prevented by the roof exhaust capability.

### 5.1.11.13 *Turbine Building*

Turbine Building HVAC is not required for safe shutdown and is not credited in the NSCA (reference 1.2.1 and 1.2.21) since building features such as high ceilings, metal siding structure with significant operable windows, availability of large overhead doors and open grating and open stairwells between the various building elevations would minimize building heatup.

### 5.1.11.14 *Miscellaneous Building*

The Oil Storage Building and All Volatile Treatment Building HVAC systems are not required for safe shutdown and is not credited in the NSCA (reference 1.2.1 and 1.2.21), due to the lack

of safe shutdown equipment. The service building only contains the condensate storage tank and, therefore, the HVAC system is not required.

## 5.1.12 Underground Yard Fire Water Loop System

The underground yard fire water loop supply provides another source of water for use as a backup to the service water system should the system become damaged and/or inoperable due to the effects of a fire. The underground yard fire water system, supplied from the local municipal fire water system, can be used to provide EDG cooling water or a backup source of inventory to the AFW Systems. This yard system is supplied from two pumps located approximately two miles from the plant. Both pumps are powered by a dedicated emergency diesel generator at that location. The pumps supply a water tower with a nominal capacity of one million gallons. This system provides hydrant flow capabilities to satisfy post-fire scenario system demands (Reference 33013-1607 and Altran Calculation Number 91171-C-01 and DA-ME-2000-001).

The use of the underground yard fire water loop to supply AFW has been previously approved by the Staff under the Ginna Systematic Evaluation Program (SEP). The system is also used to provide cooling to the EDGs in the unlikely event that service water is not available. The following sections discuss these two uses.

A dry hydrant assembly which requires the use of an off-site pumper truck was installed if an additional source of cooling water or manual fire fighting capability is needed.).

### Supply to the Standby Auxiliary Feedwater Pumps

The preferred source of feedwater for the Steam Generators is any source providing condensate grade water. The second option is Service Water with City Water via the yard loop being the third option. The underground yard loop can be aligned to the Standby Auxiliary Feedwater (SAF) pumps via a fire hose connected between the SAF water supply stub up connection at valve V-8549A. The fire hose and necessary tools are available at a hose cabinet located in the SAF pump room adjacent to the connection.

### Emergency Diesel Generator Cooling

The Diesel Generators are provided with cooling water from the Station Service Water system. Cooling water is directed to the lube oil cooler and jacket water coolers for each diesel.

ECP-2008-0040 installed two parallel [ fail open ] air operated service water isolation valves [4598G, 4598H for D/G A] [4599G, 4599H for D/G B] on the upstream side of the Diesel Generator lube oil and jacket water coolers for each Diesel Generator. This allows for the service water to be secured to the Diesel Generator lube oil and jacket water coolers when the Diesel Generator is not running. This will prevent undesired premature fouling and erosion of the lube oil and jacket water coolers that had previously occurred when service water flow through them was continuous. Both air operated valves automatically open on a Diesel Generator start signal. A parallel manual bypass valve [4598J for D/G A] [4599J for D/G B] was also installed to allow bypassing the two AOV's for service water flow to the lube oil and jacket water coolers if required. Reference drawing 33013-1250, sheet 1.

If Service Water Cooling is lost, a stub up connection is provided at each generator for a hose connection to the underground yard fire water supply loop to maintain cooling water to the diesels. A hose connected between the emergency cooling feed valves (V-8588A and V-8589A)

and the hose connection isolation valve to the D/G heat exchangers (V-4667F and V-4668F) isolating service water and opening the respective valves provides the loop connection. The fire hose and necessary tools are available at a hose cabinet located in each EDG room adjacent to the connection. The cooling water will flow from the EDG into the discharge canal, as during normal operation.

Procedures have been developed and are available to perform the necessary actions required to implement the two configurations described above.

### 5.1.13 Instrument and Service Air Systems

The instrument air system supplies filtered air chiefly as the motive power for valve actuation. The system consists of three air compressors with an associated aftercooler and air reservoir for each compressor. Air from the receivers is supplied to the instrument air header through filters and an air dryer. The instrument air header delivers air to the various valve actuators, piping penetration pressurization system and containment air and proof test system. An additional source of air supply to the instrument air header is from the service air system compressor.

The service air system provides filtered dry air for use for IA and for the maintenance of air connections throughout the station, for fire water storage tank pressurization, and the turbine lube-oil system. The system is also equipped with a diesel air compressor located adjacent to the north side of the turbine building wall outside. The diesel compressor has equal capacity to the A/C SA compressor and is maintained connected to both the SA and IA systems with a rubber hose and cross tie valves. The compressor engine is also equipped with a block heater to maintain it in a ready condition during cold weather.

## 5.2 Safe Shutdown Components

A list of safe shutdown components by system can be found in the Genesis software (reference 1.2.22).

Former equipment utilized for 10CFR50 Appendix R compliance is identified in FCMS by association with the IP-QAP-1 safety classification rule 3.1.4.18 "Systems or components whose specific function is to ensure alternative shutdown capability and are subject to the requirements of 10CFR50 Appendix R". Fire protection equipment is associated with the rule 3.1.4.2, "Fire detection, suppression, principal barriers and mitigation systems and components used to protect safety-related or safe shutdown equipment." Modifications associated with NFPA 805 were all completed upon start up from the 2018 fall outage.

# 6.0 Primary Control Station (PCS)

## 6.1 Introduction

The formally named "Alternate Shutdown" or "Dedicated Shutdown" stations are now referred to as a "Primary Control Station (PCS)".

PCSs are documented as the Charging Pump Room (ABELIP) and the Intermediate Building North (IBELIP) stations.

Technical Specification 5.2.2 and 10 CFR 50.54(m)(2)(i) for Ginna require that at least six operators and a Shift Technical Advisor (STA) are available when not in cold shutdown. Since the two Equipment Operators, formally known as Auxiliary Operators, assigned to the shift crew are also assigned to the fire brigade and would not be available for the first hour, only four operators (SS, CRF, RCO, and CO) and the STA are assumed to be available. These four operators and the STA perform the safe shutdown functions as described in the ER-FIRE series and other procedures.

These four operators and the STA would be augmented at the end of the first hour by the operators and other plant staff recalled as part of the accident recovery team. This analysis assumes the availability of a sufficient number of personnel arriving on-site after the fire is extinguished to ensure a safe transition to cold shutdown.

For a fire in any plant area, the required safe shutdown functions can be achieved and maintained either by use of protected plant equipment operated from the Control Room in the normal mode, or by the operation of required equipment from a designated primary control or support station. For the majority of fires, safe shutdown can be accomplished from the Control Room. However, for a fire in the areas of concern, shutdown from the Control Room may not be possible. Because of this, certain remote plant locations have been designated as primary control and support stations. A fire at these locations does not impair the achievement and maintenance of safe shutdown from the Control Room. These locations are described in the following subsections.
Note: Activities that occur in the MCR or at the Primary Control Stations are not considered "Recovery Actions" as defined in NEI 04-02 and RG 1.205. Actions at Support Stations, which are staffed in a transient nature, are considered "Recovery Actions". The Primary Control Stations and Support Stations are described in the following subsections:

### 6.1.1 *Charging Pump Room (Primary Control Station, ABELIP)*

This station is required for local control and operating of Charging Pump 1A. An existing transfer switch and local start/stop switches for Charging Pump 1A are utilized in conjunction with independent primary pressure and pressurizer level indication. Additionally, Emergency DC Control Power Transfer Switch for charging pump 1A is installed in the ABELIP. Control

circuits between Bus 14 and the Control Room can be isolated from the charging pump room to prevent fire-induced damage to the local control circuits. The indications are supplied with 120V AC from an inverter supplied from the local control circuit DC power supply.

### 6.1.2 *Intermediate Building North (Primary ControlStation, IBELIP)*

This station is required for operation of the Turbine-Driven AFW pump. The DC motor-operated steam admission valves located one level directly above the pump is locally opened to initiate turbine and pump operation. The pump discharge valve is locally throttled to control steam generator level. Indications routed to this location include RCS loop A hot and cold leg temperatures, steam generator A level and pressure, Steam Generator B level, and Turbine-Driven AFW flow. These indications provide adequate monitoring information to the secondary plant operator stationed at this location. These independent instrument loops are powered from an inverter supplied from a spare DC power feed from the Turbine Building DC distribution panel.

### 6.1.3 *Emergency Diesel Generator Area (Support Station, EDGIA Emergency Local Control Panel)*

This station is initially manned for as long as required to start up and ensure continued operation of the emergency diesel generator 1A (EDG1A). Local control capability at each EDG has been verified to isolate start/stop control circuits from areas outside the EDG cubicles. Both DC and AC power feeds to the EDGs and DC distribution panels are protected or adequately separated to ensure that, given a fire in any plant fire area, at least one EDG can be started.

Continued operation of the EDG depends on the transfer of fuel oil from the supply tank to the day tank. Protection of the DC control and AC power feeds to MCC 1H has been provided to assure operability of the transfer pump and a long-term supply of fuel oil.

Certain fire scenarios may cause loss of service water cooling to the EDGs. If the service water pumps are unable to be operated locally at the breaker, then a fire hose connection on each EDG will be used to supply cooling water from the underground yard fire water supply. The tested flow from one hydrant connection is approximately 800 gpm. Each EDG requires approximately 320 gpm for normal cooling. The operator makes this connection prior to starting the appropriate EDG (Reference ER-DG.2, Alternate Cooling for Emergency D/Gs). ESR-12-0412 (ECP-13-001028) installed fusing for the breaker position indicating light circuit in EDG1A Emergency Local Control Panel to prevent a potential short in a fire impacting the power to EDG1A start circuit and to the EDG Fuel Oil Transfer Pumps.

### 6.1.4 *Miscellaneous Valve Locations (Support Stations)*

Various valves must be checked and verified closed in order to ensure primary system integrity and to preclude spurious operation of these valves affecting the achievement and maintenance of safe shutdown. These valves are discussed in the NSCA (reference 1.2.1 and 1.2.21) and the Fire Risk Evaluation (FRE) (reference 1.2.2) along with the reason for ensuring closure. Other valves located in the specific flow path for a particular safe shutdown system (e.g., RHR) are verified open or closed prior to the operation of the system. Valves that must be verified open or closed, either to ensure normal system operation or to prevent a spurious operation, will have their associated power breakers (AC or DC) shut off prior to the local operation as directed procedurally.

## 6.2. Summary of Repair and Shutdown Operational Procedures for Fires

Various procedures have been developed to guide the operators for specific fire areas at Ginna. The Fire Response Plan procedure set was developed for a guideline for the fire brigade for each fire zone. Procedures were developed to provide operations instructions for achieving and maintaining Mode 3, hot shutdown conditions in the event of a fire in the power block. These procedures are described in section 8.0. These procedures include operating and repair instructions to transition to cold shutdown if deemed necessary.

# 7.0 Analysis Results

## 7.1 Introduction

The method to accomplish Safe Shutdown for each fire area is included in the B-3 Table (Appendix H). Each method includes a clear path to meet the Nuclear Safety Performance goals (Reactivity Control, Inventory Control, Pressure Control, Decay Heat Removal, Process Monitoring, and Vital Auxiliaries Function) for each Ginna fire area. The B-3 table also includes the VFDRs (Variances from Deterministic Requirements) for each fire area identified in the NSCA (reference 1.2.1 and 1.2.21), along with the disposition of each VFDR obtained from the Fire Risk Evaluation Analysis (reference 1.2.2).

A Variance from Deterministic Requirements (VFDR) is a condition that does not meet the Deterministic Approach requirements as provided in NFPA 805 Section 4.2.3 (separation, or redundant success path, installation of automatic fire detectors and fire suppression system throughout the fire area, etc.). The formal definition of Deterministic Approach is found in Volume I Part II.

Each fire area has distinct VFDR numbers (VFDR-ABBM-XXX, VFDR-ABI-XXX, etc.). For example VFDR-ABBM-005 represents a condition within fire area ABBM which does not meet a specific Nuclear Safety Performance goal, and in this specific VFDR it is the Vital Auxiliaries function due to the loss of service air or instrument air which is used to manipulate SSD equipment. This specific VFDR was evaluated in the Fire Risk Evaluation and it was determined that no recovery action or plant modification is credited to resolve the VFDR and the delta risk is low.

Each VFDR was examined individually and a path forward for its resolution was developed in the Fire Risk Evaluation (reference 1.2.2), and is documented in the disposition section of the B-3 table (Appendix H). The method of evaluation for disposition of the VFDRs was one of the following:

- Deterministic Resolution by Plant Modification. A plant modification will bring issue into deterministic compliance

- Delta Risk Evaluation with No Recovery Action Credited. This disposition consists of a numerical evaluation of the delta risk between the post-transition plant and the deterministically compliant plant with no recovery action or plant modification is credited to provide a reduction in delta risk.

- Delta Risk Evaluation Crediting Plant Modification But No Recovery Action. A proposed plant modification is credited to provide a specific reduction in delta risk for the VFDR. This category is different from the first category in that the credited plant modification is not sufficient to provide a deterministic resolution of the associated VFDR.

- Delta Risk Evaluation with Recovery Action(s) Credited. A recovery action is credited to provide a reduction in delta risk. No proposed modification is credited.

- Delta Risk Evaluation Crediting Plant Modifications and Recovery Action(s). A proposed plant modification along with a recovery action is credited to provide a specific reduction in delta risk for the VFDR.

- Insignificant Delta Risk Based on Qualitative Evaluation. No numerical evaluation of the delta risk is performed for the VFDR, rather a qualitative evaluation shows that the delta risk is insignificant. No recovery action is credited.

The B-3 Table (Appendix H) contains the dispositions of the VFDRs.

## 7.2 Modifications

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 committed modifications as identified in Appendix G and recovery actions identified in Appendix I to be incompliance with 10 CFR 50.48(c).

Modifications to the plant are evaluated for impact to the Fire PRA using plant procedures. Fire PRA impacts are evaluated during design and prior to design implementation. Fire PRA change risk review analyses are used to evaluate the NFPA 805 Fire PRA impacts in risk due to plant configuration, program, or procedure changes. Fire PRA can be affected by both temporary and permanent changes to plant configurations.

Temporary plant configuration changes in support of maintenance activities are evaluated under the Maintenance Rule a(4) program.

For the transition period (post SER, prior to completion of all NFPA805 modifications), the quantitative risk acceptance criteria for individual changes is that the risk change shall be no more than a minimal risk increase. The change should be risk beneficial or risk neutral or significantly below the thresholds of 1×10-7/year for Core Damage Frequency (CDF), and 1×10-8/year for Large Early Release Frequency (LERF) (Reference 1.2.15).

The regulatory review of the proposed changes to the approved fire protection program is performed using LS-AA-128-101 (reference 1.2.16).

## 7.3 Exemptions

The following exemptions granted against 10 CFR 50, Appendix R dated March 21, 1985 were rescinded as part of the NFPA 805 LAR. Design Analysis DA-ME-13-001(reference 1.2.4) evaluated each exemption as "Adequate for the Hazard" as defined in 10 CFR50.48(c), NFPA 805:

- An exemption from 10 CFR 50, Appendix R Section III.G.3 to the extent that a complete area-wide fixed suppression system is required in the Fire Areas for which alternate shutdown capability has been provided:

  ABBM(Auxiliary Building Basement and Mezzanine)
  CC (Control Room, Relay Room, Battery Room 1A, and Air Handling Room)
  BR1B (Battery Room 1B)
  EDG1B (Diesel Generator 1B including Vault)
  SH (Screen House)
  IBN (Intermediate Building Zone IBN of Fire Area ABI)

- An exemption from 10 CFR 50, Appendix R Section III.G.2 to the extent that 20 ft of separation between redundant steam generator pressure transmitter and circuits is required for Fire Zone IBN of Fire Area ABI

- An exemption from 10 CFR 50, Appendix R Section III.G.2 for Fire Area CT to the extent that the barrier interfaces between the Cable Tunnel and the Air Handling Room, Intermediate Building North, and Auxiliary Building Mezzanine are required to be rated to the testing procedures of nationally recognized testing laboratories.

- An exemption from 10 CFR 50, Appendix R Section III.G.2 in the Emergency Diesel Generator 1B Vault to the extent that a three-hour barrier is required between emergency diesel generator feeds.

- An exemption from 10 CFR 50, Appendix R Section III.G.2 to the extent that exposed structural steel forming a portion of the Fire Area BR1A and Fire Area BR1B boundary fire barrier has not been protected to a three hour rating.

Specific details regarding these exemptions are contained in Attachment K of the NFPA 805 LAR (reference 1.2.17).

## 7.4 NRC Approvals from the Requirements of NFPA 805 Chapter 3

As discussed in section 3.1.4 of the SE (reference 1.2.18), the NRC staff concluded that the use of Performance Based Methods to demonstrate compliance with the following fundamental Fire Protection Program elements is acceptable:

7.4.1 **Approval from NFPA 805, Section 3.3.1.3.4, which concerns portable heaters in the Plant (reference 1.2.19).**

NFPA 805 section 3.3.1.3.4 states,
*"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."*

NRC approval was granted for the acceptance of the use of the two (2) portable gas fired heaters in the Screenhouse (elevation 253'-6") for temporary heating, as needed, in the area of the circulation water pump and traveling screen area.

**Basis for Approval:**
The ability to keep the traveling screens from freezing during cold weather is necessary for normal plant operation, although not included on the SSEL. One portable gas heater is used to direct heat towards traveling screens A and B, and the second portable gas heater is used to direct heat towards traveling screens C and D [ref. 33013-2571 rev. 6]. Lake Ontario is the source of the circulating water, which is taken through the submerged intake structure. The water flows by gravity through a 10 ft diameter concrete-lined tunnel into the Screenhouse, where it passes through a fine-mesh traveling screen before being pumped through the turbine condenser or service water system. The function the traveling screens is to remove debris from the water as described in UFSAR sections 1.2.12, and 10.6.2.3.

The basis for the approval request of this difference from NFPA 805, Chapter 3 requirements is:

- Efficiency and Safety
  The ability to provide additional heat directed toward the traveling screens, to prevent icing, is safely and efficiently provided through the use of gas heating, rather than the use of portable electrical heat. The need for additional gas heat is during the winter season, generally during exceptionally cold periods during the months of December through March. When not in use, the gas supply to the portable heaters is procedurally isolated from the building. The portable torpedo/salamander type natural gas heaters have a heating output of 1,500,000 BTU per unit. There are two units for a total heating capacity of 3,000,000 BTU. A typical forced air portable electrical heater (480V) has a BTU output of approximately 102,000 BTUs/unit. To provide an equivalent BTU rating of 3,000,000 BTU, it would require approximately 30 electrical units. The electric start for the portable gas heaters uses a 120 V power. To supply power to 30 (480V) electrical heaters would require tying into a 480 V bus. Within the Screen House the 480 V busses are supply power to safety related equipment. Supplying non safety related equipment with a safety related power source would be adverse to the NSCA.

- Location of gas heaters outside the Zone of Influence – no impact to equipment credited in NSCA
  The equipment identified to be important to nuclear safety is outside the Zone of Influence (ZOI) of the portable gas heaters. It can be conservatively assumed that the impact of ignition of these heaters would be bounded by the impact of a hydrogen storage tank fire. Section N.2.3 of the NUREG/CR-6850 recommends assuming damage to, and ignition of, combustibles within 10 to 15 feet of the outer limit of the tank. Based on a walkdown of the Screenhouse, the closest equipment credited in the NSCA (the motor fire pump and the service water pumps) is approximately 40 feet at a minimum from the location of the portable gas heaters. This is significantly beyond the ZOI for these heaters, and is therefore acceptable.

- Defense - in - depth
  Operator walk downs for the Screen House are established at (2) tours per shift per procedure O-6.1, "Auxiliary Operator Rounds and Log Sheets". There is a hose station located in this fire zone (SH-2, Operating Floor Elev. 253'-6") and portable fire extinguishers available to control and extinguish fires in this area. S18 is an automatic sprinkler system which provides suppression protection for the service water pump area and fire pump area and is fed by the yard loop fire water system. Detection system Z26 smoke detectors provide detection protection for the service water pump, fire water pump, and switchgear area. Exterior yard hydrant lines are also available for manual fire fighting capability. Special provisions for fire protection in fire zone SH-2 include a curb around the diesel fire pump and the diesel oil storage tank to prevent spread of flammable liquid. The curbed area is equipped with a floor drain which drains to a holding tank buried outside the screen house. Curbs are provided to prevent water and flammable liquids from flowing into the basement area below the service water pumps. The gas supply line for the two salamanders is provided with an excess flow check valve at the outdoor south wall meter station. Fire pre-plan procedure FRP-31.0 and FRP-30.0 are also in place for defense in depth to respond to a fire in the Screen House operating floor and Screen House basement.

- Administrative Control of the use of Screen House Gas Supplemental Heaters (Salamander Unit Heaters)
  The portable gas heaters (torpedo type) are installed and secured per procedures M-115 and T-35P. Specifically, the installation and removal of the Screen House Gas space heaters are administratively controlled per M-115, "Installation and Removal of Screen House Gas Space Heaters", and placed in service via T-35P, "Screen House Supplemental Heat, Placing in Service and Removal from Service". A metal gate is used gate to protect plant personnel as well as to ensure transient combustibles are not placed within the area. The heaters are located such that there is a minimum clearance of 6 feet above and 2 ½ feet on all sides separating the heater from combustible material. The gas supply line for the two portable gas heaters is permanently installed and is provided with an excess flow check valve at the outdoor south wall meter station.

  The administrative controls that install the portable heaters are M-115 (Installation and Removal of Screen House Gase Space Heaters) and T-35P (Screen House Supplemental Heat, Placing in Service, and Removal from Service). The gas line for the gas fired heater is hard piped and therefore, the location is fixed, and maintained at a distance which is at a minimum of 40 feet.

- Geometry of portable gas heater
  The portable gas heaters are located on a noncombustible base or floor and the geometry of the units are such that they are not subject to over- turning.

- Combustible Loading
  The control of combustibles is administratively controlled through procedures and tracked within design analysis DA-ME-98-004. Specifically, FPS-16 (Bulk Storage of Combustible Materials and Transient Fire Loads), EP-3P-0132 (combustible loading worksheet), and A-905 (Open Flame, Welding, and Grinding Permit) administratively control the use of combustibles. FPS-16 was replaced by OP-AA-201-009, and A-905 was replaced by OP-AA-201-004.

  There is no impact to the combustible loading analysis (ref. DA-ME-98-004) when the portable gas heaters are in service due to the hard piping of the gas supply. Transient combustibles are tracked administratively through OP-AA-201-009. The Fire Marshal or designee reviews the permit for the proposed usafe and/or storage of transients, in regards to location, and includes potential restrictions to be followed as necessary. The Temporary Combustible Permit is periodically reviewed to ensure restrictions are being followed and documented as part of the plant inspection program performed per A-54.7, Fire Protection Tour. Additionally, during the intial installation of the portable heaters, via procedure M-115, there is a step to notify the Fire Marshal prior to performing the procedure. This will ensure the potential for a transient already in place in the Screen House to be evaluated for relocation if it is in the proximity of the two portable gas fired heaters.

**Acceptance Criteria Evaluation**
**Nuclear Safety and Radiological Release Performance Criteria:**
The use of (2) portable natural gas heaters for use in the Screenhouse does not affect nuclear safety or radiological release performance criteria. The portable gas heaters do not impact nuclear safety criteria since they are located outside the ZOI of the NSCA components located in the Screen House, being the fire pumps and service water pumps. The design features of this building (installed sprinkler systems, detection systems, hose reels, fire extinguishers, curbing, and construction) provide reasonable assurance that, in the event of a fire, the plant is not placed in an unrecoverable condition. Plant tours also contribute to nuclear safety. The Circulating Water pumps are not credited in the NSCA. The Screenhouse is not a radiologically controlled area, and therefore will not impact the radiological release performance criteria.

**Safety Margin and Defense-in-Depth:**
The safety margin for the use of (2) portable natural gas heaters in the Screenhouse will remain unchanged since the use of combustibles in this area is procedurally tracked, the equipment is monitored (procedure O-6.1), and the location is such that it would not impact any NSCA equipment.

The three echelons of defense-in-depth are 1) to rapidly detect, control, and extinguish fires from starting (combustible/hot work controls), 2) to rapidly detect, control, and extinguish fires that do occur; thereby, limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans), and 3) to provide adequate level of fire protection for systems and structures so that a fire will not prevent essential safety functions from being performed (fire barrier, fire rated cable, success path remains free of fire damage, recovery actions). The introduction of portable fuel-fired heaters does not

impact fire protection defense-in-depth.

Echelon 1 is maintained by the control of combustibles within this fire area through the use of bulk storage of combustible materials and transient fire loads procedure (FPS-16), EP-3P-0132 (combustible loading worksheet), and A-905 (Open Flame, Welding, and Grinding Permit).

The introduction of portable heaters does not affect echelons 2 and 3. The installation and line up of the (2) portable natural gas heater in the Screenhouse is controlled by M-115 and T-35P. These heaters do not result in compromising automatic or manual fire suppression functions, fire protection for systems and structures, or post-fire safe shutdown capability.

7.4.2 **Approval from NFPA 805, Section 3.3.5.1, which concerns minimizing wiring above suspended ceilings, and where installed, requires electrical wiring to be listed for plenum use or routed in armored cable, metal conduit, or cable trays with solid metal top and bottom covers (reference 1.2.19).**

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."

NRC approval was granted for a Performance-Based (PB) method to demonstrate an equivalent level of fire protection for the requirement of NFPA 805, section 3.3.5.1 regarding wiring above suspended ceilings.

**Basis for Approval:**
Ginna has wiring above suspended ceilings that may not comply with the requirements of this code section. Suspended ceilings were identified in the following areas:
- Control Room
- TSC (Technical Support Center) and adjoining hallway
- Service Building Basement office areas

These areas are not risk significant with the exception of the Control Room. A walkdown of these areas revealed that the majority of the wiring is communication systems or lighting systems related.

Control Room
The FIN (Fix it Now) team determined there are no active power cables above the suspended ceiling of the Control Room. One cable was abandoned in place with no power to it. Overall the cabling in the Control Room has a very low possibility of a fire due to limited combustible loading, discontinuity of combustibles, and the inherent features of the electrical circuit design.

The Control Room HVAC system design and operation supports the rapid identification of combustion products if a fire were to occur in the MCR suspended ceiling. The normal Control Room HVAC system is located in the basement floor of the three-story Control Building and is connected to the Control Room Envelope (CRE) by supply and return ducts that are located in the stairwell. The normal HVAC system supports the NORMAL and PURGE modes of operation. The system includes a supply and return air fan and in the NORMAL mode provides fresh outside air and exhaust, coarse filtration, and heating or

cooling via electric heating or chilled water cooling coils. The NORMAL system includes a separate fan for lavatory exhaust, which is isolated in the EMERGENCY mode of operation. In the PURGE mode of operation the NORMAL system has the same functions described above while also providing the maximum amount of fresh air and exhaust air to purge airborne contaminants from the CRE.

The normal HVAC system's outside air intake duct is equipped with redundant trains of radiation, chlorine, and ammonia monitors. Any one of these six monitors reaching their setpoint will actuate the EMERGENCY mode of operation, employing the Control Room Emergency Air Treatment System (CREATS), along with providing an alarm in the Control Room. The normal HVAC system is also equipped with a smoke detector that monitors return air in the duct between the CRE and the return air fan, and provides an alarm in the Control Room. The Control Room Emergency Air Treatment System (CREATS) simply isolates and recirculates air within the CRE boundary in a closed-loop system. The existing fire detection system or the Control Room operators who are continuously present in the area would quickly identify the presence of smoke while the air is being recirculated.

The observed video/communication/data cables above this suspended ceiling are approximated to be less than 5% of the total space. Video/communication/data cables are low voltage. These low voltage cables are not generally susceptible to shorts which would result in a fire. The Control Room does contain NSCA components/equipment. Portable fire extinguishers are available in this zone. Hose reels are available for use on the Turbine Building Operating floor, if required. Smoke and heat detectors provide area detection for the Control Room, although they are not located above the suspended ceiling.

<u>Technical Support Center (TSC) and adjoining hallway</u>
A walk down determined that the quantity of wiring which may not be plenum rated or routed in a metallic conduit, above these ceilings is minor. Approximating, less than 1% of the space above the suspended ceilings in the TSC and adjoining hallways is occupied by electrical wiring that may not be listed for plenum use, routed in armored cable, or routed in metallic conduit. The majority of this wiring is low voltabe communications wiring or lighting systems related. There are no intervening combustibles in the space above the suspended ceilings since the vast majority of equipment is metal, and all other wiring is routed in conduits.

The TSC hallway is located between the TSC and the Turbine Building Mezzanine and other rooms including the TSC diesel generator room, TSC inverter room, and TSC battery room. 3 hr fire door F7 (TSC south hallway door) is located between the TSC south hallway and the Turbine Building Mezzanine. 3 hr fire door F8 is located between the TSC south hallway to the TSC battery room, 3 hr fire door F9 is located between the TSC south hallway to the TSC inverter room, 3 hr fire door F10 is located between the TSC south hallway to the TSC diesel generator room, 3 hr fire door F11 is located between the TSC south hallway to exterior, 3 hr rated fire door F12 betwwen the TSC south hallway to the TSC office area, and a 3 hr rated fire door F14 (TSC north hallway door) between the TSC north hallway. [References EPM-FPPR, 33013-2617,1 and 21488-0119,3]. There also are 3 hr rated walls between the TSC north and south hallway and the Turbine Buidling Mezzanine, along with a 3hr rated fire wall between the Safety Assessment System (SAS)/Power Plant Computer System (PPCS) computer room and the Turbine Building Mezzanine [EPM-FPPR and penetration database].

There were no ignition sources observed during the walk downs and the proximity of the wiring to areas containing NSCA equipment is not an issue since there are 3 hr rated walls and penetrations between these areas. There is also detection located in the hallways, and rooms within the TSC along with S30 automatic sprinkler system which provides suppression coverage for the TSC Diesel Generator Room and Operational Support Center. S27 is an automatic halon suppression system which provides suppression for the SAS/PPCS computer room and subfloor. Portable fire extinguishers are available in this zone and in adjacent fire areas/zones along with hose stations.

Service Building Basement office areas

A walk down of the electric shop and mechanical maintenance administrative areas (fire zone SB-1) was conducted due to their proximity to the Primary Water Treatment room (fire zone SB-1WT) which contains NSCA equipment including the condensate storage (CST) tanks and CST local level indicator. There was only (1) de-energized power cable observed above the electric shop ceiling. The quantity of electrical wiring that may not be listed for plenum use, routed in armored cable, or routed in metallic conduit above the suspended ceilings above the electric shop and maintenance administrative areas was observed to be minor (less than 1% of space) and classified as video/communication cables. There are no NSCA components located in fire zone SB-1. There are no ignition sources above these ceilings. Although there is a non-rated wall between the Primary Water Treatment room and the Service Building Basement, S19 is an automatic sprinkler system that provides suppression protection in fire zone SB-1 and SB-1WT. Portable fire extinguishers are available in this zone, and there are hose stations available in adjacent fire areas/zones as well as yard hydrant connections.

The basis for the approval of this difference from NFPA 805, Chapter 3 requirements is:
There are no ignition sources above these ceilings
The wiring above ceilings in offices, conference rooms, laboratories, lobbies, etc. do not pose a hazard:
Low voltage is not susceptible to shorts causing a fire
There is a lack of continuity of combustibles
There is no equipment important to nuclear safety in the vicinity of these cables
Modification Design Process requires new installations to use plenum-rated equivalent or armored cable (Note: FAQ 06-0022 identified acceptable electrical cable flame propagation tests). Plenum-rated cable is tested to NFPA-262.
Power, control or instrumentation cables installed are either IEEE-383 qualified (or equivalent) or provided with a flame retardant coating.

**Acceptance Criteria Evaluation**

**Nuclear Safety and Radiological Release Performance Criteria:**

The location of wiring above suspended ceilings does not affect nuclear safety since: (1) the space enclosing these cables are non-combustible, (2) the location of wiring above the suspended ceilings has a minimum amount of nearby ignition sources considering the adjacent power, control, or instrument cables, and (3) the video/communication/data cables are low energy and therefore pose a low fire ignition hazard due to hot shorts. Therefore, there is no impact on the nuclear safety performance criteria.

The wiring above the suspended ceilings 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 type of cables or locations of suspended ceilings.

**Safety Margin and Defense-in-Depth:**
The amount of non-rated and non-enclosed wiring above the ceilings in the Power Block is minor and does not present a significant fire hazard. Therefore, the safety margin inherent in the analysis for the fire event has been preserved.

The three echelons of defense-in-depth are 1) prevent fires from occurring (hot work and other administrative control), 2) rapidly detect, control and extinguish fires that occur thereby limiting damage (fire detection systems, automatic fire suppression systems, manual fire suppression and pre-fire plans to aid the fire brigade), and 3) provide an 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). The prior introduction of non-listed video/communications/data cables routed above suspended ceilings does not directly result in compromising automatic fire suppression systems, manual fire suppression functions, or post-fire safe shutdown capability.

The inherent safety margin remains unchanged. The introduction of non-listed video/communications/data cables routed above suspended ceilings does not impact fire protection defense-in-depth. The video/communication/data cables routed above suspended ceilings does not directly result in compromising automatic fire suppression or detection functions, manual fire suppression function, or post-fire safe shutdown capability.

7.4.3 **Approval from NFPA 805, Section 3.3.5.3, which concerns electrical cable construction, specifically the justification of the use of video/communication/data cables (reference 1.2.19)**

NFPA 805 section 3.3.5.3 states,
*"Electric cable construction shall comply with a flame propagation test as acceptable to the AHJ."*

NRC approval was granted for the acceptance of a Risk-Informed Performance-Based (PB) method to demonstrate an equivalent level of fire protection for the requirement of NFPA 805, Section 3.3.5.3 regarding an acceptable flame propagation test for electric cable construction. The scope of this request includes video/communication/data cables. NRC approval of a Risk-Informed PB method is needed to justify the use of cable that may not comply with the requirements of this code section, which are not necessarily tested in accordance with the flame propagation test requirements of IEEE-383, or any other qualification standard outlined in FAQ 06-0022 as endorsed by the NRC.

**Basis for Approval:**
The video/communication/data cables are not necessarily tested in accordance with the flame propagation tests outlined in the FAQ 06-0022 as endorsed by the NRC. These low voltage cables are not generally susceptible to shorts which would result in a fire, therefore self-ignited fires are not a concern. An exposure fire could potentially ignite the cables, although the same fire would result in damage to other cables in the vicinity.

With the exception of the telephone communications room located in fire area BOP/ zones

TB-2 (Turbine Building Mezzanine), and TSC-1M (Administrative Computer Room), along with the Control Room (fire area CC/ zone CR), the remaining areas contain a limited quantity of this wiring which is sufficiently dispersed, is considered an insignificant fire hazard, and is not capable of causing fire damage to components necessary for safe shutdown.

The telephone communications room in fire area BOP/ zone TB-2 is protected by an automatic sprinkler system S38. Portable fire extinguisher, and hose stations are also available in this fire area. A fire in this room would be readily extinguished by the automatic actuation of sprinkler system S38.

TSC-1M is protected by smoke detectors S34D1 and S34D2, portable fire extinguishers, and hose stations in adjacent areas. A potential fire in this area would be detected and consequently extinguished.

BOP/CR is protected by a constantly manned area, Z19 smoke and heat detectors, portable fire extinguishers, and hose reels available in adjacent areas. A potential fire in this area would be readily detected due to the constantly manned area, and consequently extinguished.

The combustible loading in these areas is tracked within DA-ME-98-004 and transient combustibles are tracked administratively through FPS-16. FPS-16 has been replaced by OP-AA-201-009.

**Acceptance Criteria Evaluation**
**Nuclear Safety and Radiological Release Performance Criteria:**
Video/communication/data cables are low-voltage cable not susceptible to shorts that would result in a fire. Therefore, there is no impact on the nuclear safety performance criteria.

The flame propagation testing of electrical cable construction 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 flame propagation tests of cables.

The limited use of video/communication/data cabling has been shown to be acceptable and does not create or pose an un-acceptable fire hazard. Therefore, the radiological release performance criteria are also satisfied based on the determination of limiting radioactive release.

**Safety Margin and Defense-in-Depth:**
The introduction of non-listed video/communication/data does not impact fire protection defense-in-depth. The video/communication/data cables do not directly result in compromising automatic fire suppression or detection functions, manual fire suppression functions, or post-fire safe shutdown capability.

Exposed video/communication/data cables, installed at Ginna, with cable construction that does not comply with a flame propagation test acceptable to the AHJ is not capable of causing fire damage to components necessary for safe shutdown due to the nature of the low voltage of these cables not being susceptible to hot shorts or being a significant fire

hazard in areas other than the communications room, administrative computer room, and Control Room. The suppression system, smoke detectors, portable fire extinguishers, and hose reels is considered adequate to prevent fire propagation in these areas. The Control Room is also constantly manned. Therefore, the safety margin and defense-in-depth is maintained.

The three echelons of defense-in-depth are 1) prevent fires from starting (administrative procedures for combustible/hot work controls) via OP-AA-201-004, 2) rapidly detect, control and extinguish fires that do occur thereby limiting damage (fire detection systems, automatic/manual fire suppression, fire brigade/pre-fire plans), and 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, success path remains free of fire damage, recovery actions).

Exposed video/communication/data cables, installed at Ginna, with cable construction that does not comply with a flame propagation test acceptable to the AHJ does not affect echelon 1 of the defense-in-depth concept because cable construction is not involved with administrative procedures to prevent fire from occurring, and administrative procedures control and track combustibles at Ginna via OP-AA-201-009. In areas containing these cables which cannot be categorized as insignificant adequate detection, manual hose stream, and fire extinguishers are provided to ensure the fire is rapidly detected and controlled/extinguished by the fire brigade. Therefore, echelon 2 of the defense-in-depth concept is maintained. The telephone communications room is a room within fire zone TB-2 (Turbine Building Mezzanine). Since it is protected by an automatic sprinkler system, there is an adequate level of protection to prevent the spread of fire to systems and structures. The administrative computer room in fire zone TSC-1M, is protected by smoke detectors and hose reels, along with 3 hour concrete block wall to adjacent fire zone TSC-1N (Technical Support Center) and TB-2 (Turbine Building Mezzanine). The Control Room is protected by smoke and heat detectors, an automatic deluge spray system which provides a water curtain on the wall between the Control room and the Turbine Building Operating Floor, along with 3 hour rated walls to the exterior YARD area. Therefore, echelon 3 of the defense-in-depth concept is maintained.

7.4.4 **Approval from NFPA 805, Section 3.3.12 (1), which concerns RCPs, specificically to justify the potential oil misting from the RCPs due to normal motor consumption not captured by the oil collection system (reference 1.2.19)**

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 nonpressurized leakage sites in each reactor coolant pump oil system."

**Basis for Approval:**
The Ginna oil collection system was designed and reviewed in accordance with 10CFR50 Appendix R, Section III.O to collect leakage from pressurized and nonpressurized leakage sites in the reactor coolant pump oil system. This may not include collection of oil mist as result of pump/motor operation. Oil misting is not leakage due to equipment failure, but an inherent occurrence in the operation of large rotating equipment. It is normal for large motors to lose some oil through seals and the oil to potentially become 'atomized' in the ventilation system. This atomized oil mist can then collect on surfaces in the vicinity of the reactor coolant pump as the pump design is not completely sealed to permit airflow for

cooling. The oil mist resulting from normal operation will not adversely impact the ability of the plant to achieve and maintain safe shutdown even if ignition occurred. There are redundant reactor coolant pumps to achieve and maintain safe shutdown and there is fire detection system capability provided in the immediate vicinity of the pumps in order to detect a fire should one occur.
In addition, there is prior NRC approval of the RCP oil collection system based on Supplement 1 to the February 14, 1979 Fire Protection Safety Evaluation Report dated December 17, 1980. Specifically, for the RC Pump lube oil collection system, Item 3.1.39 of the SER states:

"In the SER we were concerned [NRC] that a fire involving reactor coolant pump lubricating oil could damage safe shutdown instrumentation and valves which are located inside the shield wall.

By letter dated June 4, 1980, the licensee provided information on the RC pump oil collection system. The licensee proposes to install an oil-tight enclosure around the high-pressure oil lift system and to provide splash guards with drip pans to control leakage from the oil cooler, piping, upper and lower oil pots and the oil fill/drain valve [verified installed reference ESM-97-009]. The oil collection system will be seismically designed [verified complete reference ESM-97-009]. In addition, strainers will be installed to prevent clogging of the drain pipes [wire mesh covers have been provided on the open drip pans, vulnerable to FME, to prevent the clogging of the drain pipes - reference ESM-97-009 and system engineer walkdown].

Based on our review, we conclude that the licensee's RCP oil collection system meets our fire protection guidelines and, therefore, is acceptable".
Ginna does not have a history of significant oil loss from the reactor coolant pumps as a result of oil misting or oil leakage that is not contained by the properly designed and installed oil leakage collection system. Ginna has not had a fire due to oil misting.

Further characterization of the misting:
RCP oil misting has a potential to uniformly deposit on surfaces in the pump bay located within Reactor Coolant System Loop A and Loop B. Oil has only been observed to accumulate on the equipment located within the pump bay when there was a malfunction of a component. However, a light sheen of oil is typically observed on equipment located within the pump bay due to misting, as well as on the walls of the RCP cubicle.

Summarizing the impact to NSCA equipment - The NSCA equipment located in fire zone RC-1 was determined not to be subject to oil misting from the RCPs due to the geometry of the reactor containment building. The NSCA equipment located in fire zones T-LOOPA and T-LOOPB that are in the vicinity of the RCPs have a potential to be impacted by oil misting; however, there is no physical evidence of oil accumulation on the equipment as verified during system engineering outage walk downs. Transient combustibles are tracked per FPS-16 and good housekeeping practices are followed at Ginna. FPS-16 was replaced by OP-AA-201-009.

TE-2007-0042 and ECP-10-000066 installed a new labyrinth seal associated with the RCPs which reduced the loss of oil significantly per refueling cycle. RCP oil loss is tracked by the system engineer.

Based on the design of the RCPs, geometry of the reactor containment, the controls of combustibles, and the ability to track the loss of oil, the ability of the NSCA components to perform their intended function when needed is ensured.

Actions are taken to clean up any oil spills from leakage or misting during refueling maintenance outages. Oil deposits are tracked using the condition report process.

Again, it should be noted that oil loss has been significantly reduced with motor refurbishments that added a labyrinth seal at the lower oil pot standpipe. This modification has resulted in a reduction in the oil lost from the lower oil pot through a fuel cycle. Actions are taken each refueling outage to wipe down any oil that may be deposited on any surfaces in the pump bay.

The bases for the approval request of this clarification of NFPA 805, Chapter 3 requirements are:

The oil collection system is designed to collect leakage from pressurized and nonpressurized leakage sites in the reactor coolant pump oil system.

Oil misted from normal operation is not leakage; it is normal motor oil consumption. Oil misted from normal operation does not significantly reduce the oil inventory.

Historically, there have been no fires at Ginna attributed to oil misting. The oil historically 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 reactor coolant pump A and B use a synthetic oil with a flash point, of approximately 428 degrees Fahrenheit (reference procedure M-1016).

The reactor coolant pumps are not required to achieve or maintain fire safe shutdown.

**Acceptance Criteria Evaluation**

**Nuclear Safety and Radiological Release Performance Criteria:**

The oil mist resulting from normal operation will not adversely impact nuclear safety. There are redundant reactor coolant pumps available as necessary. In addition, the reactor coolant pumps are not required to achieve and maintain fire safe shutdown. Therefore, the inherent safety margin remains unchanged.

The potential for oil mist from the reactor coolant pumps 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. The entire Reactor Building in which the reactor coolant pumps are located during power operations is an environmentally sealed radiological area. The oil mist does not add additional radiological materials to the area or challenge systems boundaries that contain such.

**Safety Margin and Defense-in-Depth:**

The oil mist resulting from normal operation will not adversely impact the ability of a plant to achieve and maintain fire safe shutdown even if ignition occurred. The reactor coolant pumps are not required to achieve and maintain fire safe shutdown. Therefore, the inherent

safety margin remains unchanged.

The three echelons of defense-in-depth are: 1) to prevent fires from starting (combustible/hot work control), 2) to rapidly detect, control and extinguish fires that do occur, thereby, limiting damage (fire detection systems, automatic fire suppression, manual fire suppression, pre-fire plans), and 3) to 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). The potential for oil mist from reactor coolant pumps does not impact fire protection defense-in-depth. Echelon 1 is maintained by the oil collection system and reactor coolant pump design. The introduction of a small amount of oil misting does not affect echelons 2 and 3. The potential for oil mist from the reactor coolant pumps does not result in compromising automatic fire suppression functions, manual fire suppression functions, fire protection for systems and structures, or post-fire safe shutdown capability.

7.4.5 **Approval from NFPA 805, Section 3.5.16, which concerns dedicated use of the fire protection water supply system, specificically to justify the use of the fire protection water system to supply the high pressure spray wash system (reference 1.2.19)**

NFPA 805 section 3.5.16 states, "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".

NRC approval was granted for the acceptance of the use of the fire protection water system to furnish the water to the traveling screen spray wash system.

**Basis for Approval:**
PCR 99-090, Rev. 1 modified the fire protection water system to furnish high pressure water to the traveling screen spray wash system. Automatic and manual means are provided to isolate the High Pressure Screen Wash System in the event of any automatic or manual fire suppression system actuation. Since the electric motor-driven fire pump secondary function is to supply the high pressure spray wash system only when plant conditions warrant its use, upon any automatic actuation of the electric motor-driven fire pump via a fire-suppression system demand, the high pressure spray wash system will automatically be isolated such that the primary function of supplying the fire suppression system can be satisfied. In addition, the fire protection water supply at REG is taken from Lake Ontario; therefore, the use of fire protection water to furnish the High Pressure Screen Wash System has no impact on the amount of water available for fire-fighting purposes.

**Acceptance Criteria Evaluation**
**Nuclear Safety and Radiological Release Performance Criteria:**
Since the fire protection water at REG is taken from a virtually perpetual water source, and automatic and manual means are provided to isolate the High Pressure Screen Wash

System in the event of any automatic or manual fire suppression system actuation, there is no impact on the nuclear safety performance criteria. The fire water system would be able to perform its function as designed.

The as-modified fire protection water system ability to furnish high pressure water to the traveling screen spray wash system has no impact on the radiological release performance criteria. The radiological review was performed based on the potential location of radiological concerns. The Screen house is not a radiological area and does not contain any primary systems.

**Safety Margin and Defense-in-Depth:**

The use of the fire water system to provide water to the traveling screen wash system does not impact safety margin since the primary function of the fire water system to provide water for the suppression of fires will not be impacted. The screen wash supply piping is located at the common discharge for both the diesel and motor-driven fire pump. The screen wash system cannot be placed into service unless the diesel fire pump is operable and the motor-driven fire pump discharge pressure must be maintained greater than or equal to 132 psi to ensure the most limiting suppression system flow in the event AOV-5250B fails to close automatically (isolating the screen wash system) upon receipt of a fire signal (Reference T-36.5, “Alternate Screenwash to The Traveling Screen From The Motor Fire Pump”). Normal spray wash, as supplied from the service water system, will automatically resume whenever high pressure screen water is secured. The traveling screen high pressure spray wash automatic isolation is procedurally and periodically verified (Reference STP-O-13.4.23 and Reptask PS00454).

The use of the fire water system to provide water to the High Pressure Screen Wash System does not impact the primary function of the fire water system. Failure affects have been considered in the design to assure the fire water system function is maintained during all modes of plant operation when the High Pressure Traveling Screen Spray Wash System is or is not in service. Therefore, defense-in-depth capability of the fire water system is unchanged due to this modification.

7.4.6 **Approval from NFPA 805, Section 3.2.3 (1), which concerns the establishing of procedures for inspection, testing, and maintenance for fire protection systems and features. Specifically, the approval for the use of the Performance Based method described in Electric Power Research Institute (EPRI) Report TR-1006756 (reference 1.2.19).**

NFPA 805, section 3.2.3 (1) states, “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: Inspection, testing, and maintenance for fire protection systems and features credited by the fire protection program.”

NRC approval was granted for the ability to utilize performance-based methods to establish the appropriate inspection, testing, and maintenance frequencies for fire protection systems and features required by NFPA 805. Performance-based inspection, testing, and maintenance frequencies will be established as described in Electric Power Research Institute (EPRI) Technical Report TR-1006756, “Fire Protection Surveillance Optimization and Maintenance Guide for Fire Protection Systems and Features”, Final Report, July 2003.

**Basis for Approval**:

NFPA 805 Section 2.6, “Monitoring”, requires that
*”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”.*

NFPA 805 Section 2.6.1, “Availability, Reliability, and Performance Levels,” requires that
*”Acceptable levels of availability, reliability, and performance shall be established.”*

NFPA 805 Section 2.6.1, “Monitoring Availability, Reliability, and Performance,” requires that

*”Methods to monitor availability, reliability, and performance shall be established. The methods shall consider the plant operating experience and industry operating experience.”*

The scope and frequency of the inspection, testing, and maintenance activities for fire protection systems and features required in the fire protection program have been established based on the previously approved Technical Specifications/License Controlled Documents and appropriate NFPA codes and standards. This request does not involve the use of the EPRI Technical Report TR-1006756 to establish the scope of those activities as that is determined by the required systems review identified in LAR Table C-2, “NFPA 805 Chapter 4 Required FP Systems/Features.”

This request is specific to the use of EPRI Technical TR-1006756 to establish the appropriate inspection, testing, and maintenance frequencies for fire protection systems and features credited by the fire protection program. As stated in EPRI Technical Report TR-1006756 Section 10.1, *“The goal of a performance-based surveillance program is to adjust test and inspection frequencies commensurate with equipment performance and desired reliability.”* This goal is consistent with the stated requirements of NFPA 805 Section 2.6.

The EPRI Technical Report TR-1006756 provides an accepted method to establish appropriate inspection, testing, and maintenance frequencies which ensure the required NFPA 805 availability, reliability, and performance goals are maintained.
The target tests, inspections, and maintenance will be those activities for the NFPA 805 required fire protection systems and features. The reliability and frequency goals will be established to ensure the assumptions in the NFPA 805 engineering analysis remain valid. The failure criterion will be established based on the required fire protection systems and features credited functions and will ensure those functions are maintained. Data collection and analysis will follow the EPRI Technical Report TR-1006756 document guidance. The failure probability will be determined based on EPRI Technical Report TR-1006756 guidance and a 95% confidence level will be utilized. The performance monitoring will be performed in conjunction with the Monitoring Program required by NFPA 805 Section 2.6 and it will ensure site specific operating experience is considered in the monitoring process.

The flow chart that identifies the basic process is shown in reference 1.2.19.

**Acceptance Criteria Evaluation**

**Nuclear Safety and Radiological Release Performance Criteria:**
Use of performance-based test frequencies established per EPRI Technical Report TR-1006756 methods combined with NFPA 805, Section 2.6, Monitoring Program, will ensure that the availability and reliability of the fire protection systems and features are maintained to the levels assumed in the NFPA 805 engineering analysis. Therefore, there is no adverse impact to Nuclear Safety Performance Criteria by the use of the performance-based methods in EPRI Technical Report TR-1006756.

The radiological release performance criteria are satisfied based on the determination of limiting radioactive release. Fire Protection Systems and Features may be credited as part of that evaluation. Use of performance-based test frequencies established per the EPRI Technical Report TR-1006756 methods combined with NFPA 805 Section 2.6, Monitoring Program, will ensure that the availability and reliability of the fire protection systems and features are maintained to the levels assumed in the NFPA 805 engineering analysis which includes those assumptions credited to meet the Radioactive Release performance criteria. Therefore, there is no adverse impact to Radioactive Release performance criteria.

**Safety Margin and Defense-in-Depth:**
Use of performance-based test frequencies established per EPRI Technical Report TR-1006756 methods combined with NFPA 805, Section 2.6, Monitoring Program, will ensure that the availability and reliability of the fire protection systems and features credited for defense-in-depth are maintained to the levels assumed in the NFPA 805 engineering analysis which includes those assumptions credited in the Fire Risk Evaluation safety margin discussions. In addition, the use of these methods in no way invalidates the inherent safety margins contained in the codes and standards used for design and maintenance of fire protection systems and features. Therefore, the safety margin inherent and credited in the analysis has been preserved.

The three echelons of defense-in-depth described in NFPA 805 Section 1.2 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); and 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).

Echelon 1 is not affected by the use of the EPRI Technical Report TR-1006756 methods. Use of performance-based test frequencies established per EPRI Technical Report TR-1006756 methods combined with NFPA 805 Section 2.6, Monitoring Program, will ensure that the availability and reliability of the fire protection systems and features credited for defense-in-depth are maintained to the levels assumed in the NFPA 805 engineering analysis. Therefore, there is no adverse impact to echelons 2 and 3 for defense-in-depth.

# 8.0 Operator Actions/Procedures

Procedures have been developed to guide the operators and other plant staff for the safe shutdown of the plant for each fire area. These include operational procedures and repair

procedures to achieve cold shutdown, although Ginna is licensed for hot shutdown. The capability to shutdown safely for each fire area is summarized in Section 8.3. The capabilities and methods described in Section 8.3 and in the EOP and ER-FIRE procedures are based on utilization of safe shutdown components defined in the cable tracking software and i s consistent with EPM-FPPR, table B-3 along with the Recovery Action Table located in Appendix I.

| | |
|---|---|
| ER-FIRE.0 | “Control Room Response to Fire Alarms and Reports” provides the Control Room actions necessary to respond to plant fire alarms or reports of fire and to closout fire events. |
| ER-FIRE.1 | "Alternate Shutdown for Control Room Abandonment" provides instructions to stabilize the plant in MODE 3, Hot Shutdown (HSD), and if desired establish conditions to initiate RCS cooldown, if necessary. It also provides instructions to transition to Mode 5, the restoration of equipment, and water solid S/G cooldown. |
| ATT-18.1 | “Attachment Alt RCS INJ/SAFW” provides instructions to perform Alternate RCS Injection Pump Alignment to the DI water storage tank TCD05 and the Spent Fuel Pool powered from KDG08 or KDG09, and SAFW pump alignment to the DI water storage tank TCD05 as suction source powered from KDG08 or KDG09. |
| ATT-24.0 | “Attachment Transfer Battery to TSC is used if the fire has not involved the relay room annex or the airhandling room that impacted the cabling between the TSC and the Battery Rooms. |
| FSG-4 | “ELAP DC BUS Load Shed/Management” to directly power station batteries from KBD01A 100 KW FLEX generator. |
| E-0 | “Reactor Trip or Safety Injection” |
| E-1 | “Loss of Reactor or Secondary Coolant” |
| ECA-0.0 | “Loss of ALL AC Power” |
| ECA-1.1 | “Loss of Emergency Coolant Recirculation” |
| ES-0.1 | “Reactor Trip Response” |

As part of the development of the current fire procedures, "time-critical" tasks were validated in the plant, utilizing plant operators. These tasks are listed in procedure OP-GI-102-106. As a result of the time validation, the sequences of certain tasks were altered and the assignments of tasks among operators were changed to reduce completion time for these time-critical tasks. The actual time to complete these time-critical operator tasks has been verified to meet the requirements to achieve and maintain safe shutdown and is consistent with the fire PRA.

## 8.1 Pre-fire Strategies

Pre-fire strategies and drawings have been developed for fire brigade use in responding to fires in the plant. Procedures and fire response plans are utilized to provide summary information and are organized by suppression and detection system numbers (reference FRP series procedures and drawings 33013-2540 through 33013-2581). The procedures and drawings identify the following for each fire area/zone:

- Major equipment
- Safe shutdown equipment
- Ventilation systems
- Operational concerns
- Detection/suppression systems designations including type of system and location of pull boxes
- Specialized Fire Fighting Equipment
- Fire brigade equipment including the location of fire extinguishers, hose reels, special fire fighting equipment and emergency lighting.
- Potential fire hazards and radiological concerns
- Fire barriers and their ratings for the fire area/zone, fire dampers, doors and other applicable information

## 8.2 Description of Safe Shutdown Capability by Fire Area

Appendix H describes the safe shutdown methods for each plant area. The following subsections describe issues identified for each plant fire area.

### 8.2.1 ABBM - Auxiliary Building Basement/Mezzanine Level

**Reactivity Control**

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in this area may damage all three safety injection pumps and the control and power feeds to all three charging pumps. The charging pumps are locally secured as a credited recovery action to mitigate this event by deenergizing Bus 14 and Bus 16.

The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

**Inventory Control and Decay Heat Removal**

A fire in this area has the potential for damaging the normal power feeds to the Motor-Driven AFW pumps and Standby AFW pump 1D.

The shutdown capability consists of de-energizing Bus 14 and Bus 16 and performing the

credited recovery action of aligning the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05.

## Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by tripping the reactor and both RCPs, the automatic closure of MSIVs on 2/2 low SG level channels OR 2/2 low RCS pressure channels, and placing both PRZR PORV switches to close. RCS makeup capability is through the credited recovery action of aligning the Alternate RCS Injection System.

## Vital Auxiliaries

A fire in this area has the potential for damaging 480V AC Bus 16 and MCC 1D. The DC control circuitry for 480V AC Buses 14 and 16 and power feeds to battery chargers supplying emergency DC trains A and B are routed in this area and potentially damaged by a fire. The Emergency Diesel Generator 1A power feed to Bus 14 and the DC power feed to Aux Bldg DC power panel 1A may be impacted. However, the use of the NFPA or SAFW 1MW Diesel Generator that is free from the effects of fire in this area, is used as the credited recovery action to mitigate this event.

Due to the loss of the normal station battery chargers and subsequent depletion of station batteries, the recovery action to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term indication.

## Process Monitoring

Fire damage to cabling and/or process sensing lines could cause the loss of both channels of MCB RWST level indication and potential drain down of tank. The credited recovery action of aligning the Alt. RCS injection system whose suction source is a combination of the DI water storage tank TCD05 and/or the Spent Fuel Pool.

A panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels contains indication from two Reactor Coolant System pressure channels and from two steam generator level channels.

The MCR abandonment procedure includes PRA credited actions at the shutdown panels (ABELIP and IBELIP) as a backup to monitor plant parameters.

The portable source range drawer is available for use in the Intermediate Building.

### 8.2.2 ABI - Auxiliary Building/Intermediate Building

## Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

Fire damage to cabling could potentially result in reactor trip breaker “open” function not

being available. A credited recovery action of locally tripping the reactor mitigates this event.

Fire damage can potentially impair Charging and Safety Injection. The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool. A recovery action to locally trip the charging pumps is also associated with this fire area.

## Inventory Control and Decay Heat Removal

A fire in this area could damage cabling and potentially impair the Motor-driven AFW Pumps 1A & 1B, Standby AFW Pump 1C and the Turbine-Driven AFW Pump.
The shutdown capability consists of de-energizing Bus 14 and Bus 16 and performing the credited recovery action of aligning the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05.

## Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by tripping the reactor and both RCPs, the automatic closure of MSIVs on 2/2 low SG level channels OR 2/2 low RCS pressure channels, and placing both PRZR PORV switches to close. RCS makeup capability is through the credited recovery action of aligning the Alternate RCS Injection System.

## Vital Auxiliaries

A fire in this area has the potential for damaging 480V AC Bus 14, MCC 1C and long-term Train A DC power. The use of the NFPA or SAFW 1MW Diesel Generator that is free from the effects of fire in this area, is used as the credited recovery action to mitigate this event.

Due to the loss of the Train A battery chargers and subsequent depletion of station batteries, the recovery action to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term indication.

## Process Monitoring

A panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels contains indication from two Reactor Coolant System pressure channels and from two steam generator level channels.

The MCR abandonment procedure includes PRA credited actions at the shutdown panels (ABELIP and IBELIP) as a backup to monitor plant parameters.

### 8.2.3 BOP - Balance of lant

Either train of power and systems can be used to achieve safe shutdown following a fire in this area, with the exception of a fire in the Turbine Building Basement or Turbine Building Inter-

mediate floor, which will require operator action.

## Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in this area may affect reactor makeup capability due to the potential damage to the service air system resulting in limited charging flow to the RCS. The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

## Inventory Control and Decay Heat Removal

A fire in the Turbine Building may affect the power supply to the Turbine-Driven AFW AC lube oil pump. 480V AC power to this component remains available after energizing BUS14 from EDG1A. Redundant decay heat removal capabilities exist independent of this area using the SAFW system

## Reactor Pressure Control

Pressure control is unaffected for a fire in this area. Initially it is ensured by automatic operation of pressurizer safety valves and by RCS makeup capability as described above.

## Vital Auxiliaries

A fire in the Turbine Building may affect control circuitry to Service water Pump 1D. Train A Service Water Pumps are unaffected by a fire in this area. The emergency diesel generators are unaffected.

Fire damage can impair the ability to charge the station batteries. The recovery action to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term indication.

## Process Monitoring

A panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels contains indication from two Reactor Coolant System pressure channels and from two steam generator level channels.

The MCR abandonment procedure includes PRA credited actions at the shutdown panels (ABELIP and IBELIP) as a backup to monitor plant parameters.

# 8.2.4 BR1A - Battery Room 1A

## Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

Fire damage can impair Charging and Safety Injection. The recovery action to locally align

and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

## Inventory Control and Decay Heat Removal

Fire damage can impair Aux Feedwater. The shutdown capability consists of de-energizing Bus 14 and Bus 16 and performing the credited recovery action of aligning the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05.

## Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by tripping the reactor and both RCPs, the automatic closure of MSIVs on 2/2 low SG level channels OR 2/2 low RCS pressure channels, and placing both PRZR PORV switches to close. RCS makeup capability is through the credited recovery action of aligning the Alternate RCS Injection System.

## Vital Auxiliaries

A fire in this area has the potential for damaging train A DC power supply to the plant causing a loss of normal DC control at Bus 14 and impairing EDG 1A operation. The use of the NFPA or SAFW 1MW Diesel Generator that is free from the effects of fire in this area, is used as the credited recovery action to mitigate this event.

Due to the loss of the Train A battery chargers and subsequent depletion of station batteries, the recovery action to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term indication.

## Process Monitoring

A panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels contains indication from two Reactor Coolant System pressure channels and from two steam generator level channels.

The MCR abandonment procedure includes PRA credited actions at the shutdown panels (ABELIP and IBELIP) as a backup to monitor plant parameters.

The portable source range drawer is available for use in the Intermediate Building.

# 8.2.5 BR1B - Battery Room B

## Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI

water storage tank TCD05 and the borated water from the Spent Fuel Pool.

## Inventory Control and Decay Heat Removal

Fire damage can impair Aux Feedwater. The shutdown capability consists of de-energizing Bus 14 and Bus 16 and performing the credited recovery action of aligning the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05.

## Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by tripping the reactor and both RCPs, the automatic closure of MSIVs on 2/2 low SG level channels OR 2/2 low RCS pressure channels, and placing both PRZR PORV switches to close. RCS makeup capability is through the credited recovery action of aligning the Alternate RCS Injection System.

## Vital Auxiliaries

A fire in this area may damage 125V DC control power to Auxiliary Building DC distribution panel 1B and the DC power supply to the Turbine Building DC distribution panel 1B. Normal DC control power to 480V AC Bus 16 could be lost. To ensure Bus 14 operation, the DC train A power feed (E053) to Auxiliary Building DC distribution panel 1A has been protected with a one-hour-rated wrap in this area.

Additionally, a fire in this area has the potential for damaging power and control circuits to both EDGs, DC control power to Buses 17 and 18, and control circuits for all four service water pumps. Therefore, both EDGs are affected and remote control of the four service water pumps may be lost.

Hemyc wrap protection has been provided for the EDG1A power feed (L318) in this area to ensure 480V AC supply to Bus 14. The DC and AC power feeds to MCC 1H (C687 and E022) are also protected with hemyc wrap in this area to ensure Fuel Oil transfer pump and room cooling capability for EDG1A. Cable damage from a postulated fire is not expected to occur until 25 minutes into the event.

As a result of the loss of DC control power to Bus 18, Cooling water supply to EDG 1A will be ensured by local operation of service water pump 1A breaker.

The use of the NFPA or SAFW 1MW Diesel Generator that is free from the effects of fire in this area, is a recovery action to mitigate this event.

Due to the loss of the Train A battery chargers and subsequent depletion of station batteries, the recovery action to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term indication.

## Process Monitoring

A panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels contains indication from two Reactor Coolant System pressure channels and from two steam generator level channels.

The MCR abandonment procedure includes PRA credited actions at the shutdown panels (ABELIP and IBELIP) as a backup to monitor plant parameters.

The portable source range drawer is available for use in the Intermedate Building.

## 8.2.6 CC - Control Building Complex

### Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core. Fire damage to cabling could potentially result in reactor trip breaker “open” function not being available. A credited recovery action of locally tripping the reactor mitigates this event.

Fire damage can potentially impair Charging and Safety Injection. The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool. A recovery action to locally trip the charging pumps is also associated with this fire area.

### Inventory Control and Decay Heat Removal

A fire in this area has the potential for damaging control circuitry for the standby, Turbine-Driven and Motor-Driven AFW pumps.

The shutdown capability consists of de-energizing Bus 14 and Bus 16 and performing the credited recovery action of aligning the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05.

### Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by tripping the reactor and both RCPs, the automatic closure of MSIVs on 2/2 low SG level channels OR 2/2 low RCS pressure channels, and placing both PRZR PORV switches to close. RCS makeup capability is through the credited recovery action of aligning the Alternate RCS Injection System.

### Vital Auxiliaries

Emergency diesel generator control may be affected by fire in this area. However, the use of the NFPA or SAFW 1MW Diesel Generator that is free from the effects of fire in this area, is used as the credited recovery action to mitigate this event.

Due to the loss of the both normal station battery chargers and subsequent depletion of station batteries, the recovery action to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term indication. The recovery action of locally depowering MCB DC distribution panel A and B to ensure various components remain in their desired position is credited for a fire in this area.

## Process Monitoring

A panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels contains indication from two Reactor Coolant System pressure channels and from two steam generator level channels.

The MCR abandonment procedure includes PRA credited actions at the shutdown panels (ABELIP and IBELIP) as a backup to monitor plant parameters.

# 8.2.7 CHG - Charging Pump Room

## Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in this area may degrade the control and operation capability of all three charging pumps. However, redundant makeup capability exists outside this area by operation of Safety Injection Pump 1B from the Control Room. Safety Injection Pump 1B, taking suction from the RWST, injects directly into RCS loop A cold leg through a locked-open motor-operated valve. Primary PORV operation is necessary to reduce system pressure to allow for safety injection pump operation. PORV power and control circuits are independent of this fire area. Additionally, the Alternate RCS Injection System is available. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

## Inventory Control and Decay Heat Removal

A fire in this area does not affect decay heat removal capability. Both trains of AFW, RHR and CCW are available for use from the MCB.

## Reactor Pressure Control

Pressure control is unaffected for a fire in this area. Initially it is ensured by automatic operation of pressurizer safety valves and by RCS makeup capability as described above. The PORVs are used to depressurize the RCS to allow for Safety Injection use.

## Vital Auxiliaries

A fire in area does not affect support systems functions. Both trains of Emergency Power Systems, CCW and Service Water are available for use.

## Process Monitoring

A fire in this area has the potential for damaging ABELIP, however, adequate indication exists independent of this area and is available for use at the main control board. A panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels contains indication from two Reactor Coolant System pressure channels and from two steam generator level channels.

## 8.2.8 CT -Cable Tunnel

### Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core. Fire damage to cabling could potentially result in reactor trip breaker “open” function not being available. A credited recovery action of locally tripping the reactor mitigates this event.

Fire damage can potentially impair Charging and Safety Injection. The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool. A recovery action to locally trip the charging pumps is also associated with this fire area.

### Inventory Control and Decay Heat Removal

A fire in this area has the potential for damaging power feeds to both Motor-Driven AFW pumps and control circuitry for the standby, Turbine-Driven and Motor-Driven AFW pumps.

The shutdown capability consists of de-energizing Bus 14 and Bus 16 and performing the credited recovery action of aligning the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05.

### Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by tripping the reactor and both RCPs, the automatic closure of MSIVs on 2/2 low SG level channels OR 2/2 low RCS pressure channels, and placing both PRZR PORV switches to close. RCS makeup capability is through the credited recovery action of aligning the Alternate RCS Injection System.

### Vital Auxiliaries

Emergency diesel generator control may be affected by fire in this area, however, the use of the NFPA or SAFW 1MW Diesel Generator that is free from the effects of fire in this area, is used as the credited recovery action to mitigate this event.

A fire in this area also has the potential for damaging trains A and B 480V AC battery charger feeds. The recovery action is to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term indication.

### Process Monitoring

A panel located in the Main Control Room (MCR), outside the zone of influence of other MCR panels contains indication from two Reactor Coolant System pressure channels and from two steam generator level channels.

The MCR abandonment procedure includes PRA credited actions at the shutdown panels (ABELIP and IBELIP) as a backup to monitor plant parameters.

## 8.2.9 EDG1A - Emergency Diesel Generator 1A Area

### Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

Charging Pump 1A and Safety Injection Pump 1A could be rendered inoperable for a fire in this area. The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

### Inventory Control and Decay Heat Removal

A fire in this area has the potential for rendering Motor-Driven AFW pump 1A and Standby AFW pump 1C inoperable. However, the Turbine-Driven AFW pump is available for use from the Control Room using train B DC power. Additionally, SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05 are available.

### Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by RCS makeup capability as described above.

### Vital Auxiliaries - EDG1A

A fire in this area has the potential for damaging EDG1A along with the 480V AC power feeds to Bus 14 and 18. However, EDG 1B is unaffected and available for use with Buses 16 and 17. Service water cooling to EDG1B is available.

Due to the loss of the normal Train A station battery charger and subsequent depletion of A battery, alignment of the TSC battery charger to Train A DC system may be necessary to supply long-term power to required process instrumentation.

### Process Monitoring

At least one set of Process Monitoring Instrumentation will be available in the Control Room following a fire in this area.

### 8.2.10 EDG1B - Emergency Diesel Generator 1B Area

#### Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in this area has the potential for affecting the operability of train B charging and safety injection pumps. The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

#### Inventory Control and Decay Heat Removal

A fire in this area has the potential for rendering Motor-Driven AFW pump 1B and Standby AFW pump 1D inoperable. However, the Turbine-Driven AFW pump is available for use from the Control Room. Additionally, SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05 are available.

#### Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by RCS makeup capability as described above.

#### Vital Auxiliaries

Control circuits for both service water pumps may be damaged due to a fire in this area. However, the use of the NFPA or SAFW 1MW Diesel Generator that is free from the effects of fire in this area, is used as the credited recovery action to mitigate this event. Additionally, there is a Multiple Spurious Operation (MSO) concern related to BUS14 power supply associated with a fire this area. The recovery action is to align the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers is a mitigation strategy to provide power for long-term indication.

#### Process Monitoring

At least one set of Process monitoring instrumentation will be available in the Control Room following a fire in this area.

### 8.2.11 RC - Reactor Containment

Either train of power and systems can be used to achieve safe shutdown following a fire in this area, unless otherwise noted below.

#### Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in this area does not affect makeup or reactivity control capability. Both safety injection and charging pump operation are available. Additionally, RCS makeup capability is also available using the Alternate RCS Injection System.

Potential exists for spurious valve operations that could cause inadvertent draining or depressurization of the RCS. Operator action may be required to de-energize various power supplies and/or locally reposition valves to mitigate these spurious concerns.

## Inventory Control and Decay Heat Removal

The Turbine-Driven or Standby AFW pump can be operated independent of this area to support decay heat removal capability

## Reactor Pressure Control

Pressure control in this fire area is ensured by automatic operation of pressurizer safety valves and by tripping the reactor and both RCPs, the automatic closure of MSIVs on 2/2 low SG level channels OR 2/2 low RCS pressure channels, and placing both PRZR PORV switches to close. RCS makeup capability as described above.

## Vital Auxiliaries

Service water, CCW and Emergency Power Systems are unaffected by a fire in this area. Either train of these systems can be used to support safe shutdown.

## Process Monitoring

A fire in RC could damage certain process monitoring functions. The installation of radiant energy shields separates redundant trains of pressurizer level, source range and RCS pressure indication and results in at least one channel of each variable remaining free of fire damage. All other process variables required to support safe shutdown have at least on channel outside this area or are provided with greater than twenty feet of horizontal separation free of intervening combustibles.

## 8.2.12 SAF - Standby Auxiliary Feedwater Pump Building

Either train of power and systems can be used to achieve safe shutdown following a fire in this area, unless otherwise noted below.

### Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in area does not affect makeup or reactivity control capability. Both safety injection and charging pump operation are available for use from the Control Room.

### Inventory Control and Decay Heat Removal - SAF

A fire in this area may damage both standby auxiliary feedwater pumps. However, redundant capability exists to achieve initial decay heat removal independent of this area using the Turbine-Driven Auxiliary Feedwater System.

### Reactor Pressure Control - SAF

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by RCS makeup capability as described above.

### Vital Auxiliaries - SAF

A fire in this area does not affect any of the credited support system functions. Either train of Emergency Power, Service Water and CCW can be operated from the Control Room.

### Process Monitoring - SAF

A fire in this area does not affect any of the credited process monitoring functions. At least one set of Process instrumentation is available at the MCB.

## 8.2.13 SH -Screen House

### Reactivity Control

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in this area has the potential to render Charging Pump 1A inoperable. The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

### Inventory Control and Decay Heat Removal

A fire in this area may damage service water and ultimately impair the TDAFW pump. The credited recovery action is to align the SAFW pumps powered from the NFPA or SAFW 1MW Diesel Generator with suction from the DI water storage tank TCD05.

### Reactor Pressure Control

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by RCS makeup capability as described above.

### Vital Auxiliaries

A fire in this area could affect both diesel generators. However, the use of the NFPA or SAFW 1MW Diesel Generator that is free from the effects of fire in this area, is used as the credited recovery action to mitigate this event.

Due to the loss of the Train A battery chargers and subsequent depletion of station batteries, alignment of the TSC battery charger to Train A DC system may be necessary to supply long-term power to required process instrumentation. Additionally, the use of the TSC diesel generator and the TSC battery charger, or the recovery action to align the 100 kW diesel generator (KBD01A) directly to either of the safety related battery chargers can provide power for long-term indication.

### Process Monitoring

At least one set of process monitoring instrumentation will be available in the Control Room following a fire in this area to support safe shutdown.

## 8.2.14 PA – Protected Area

### Reactivity Control - PA

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in this area can impair Charging and Safety Injection due to a loss of "B" 125V DC power or a loss of instrument air to AOV 112B (isolates the RWST from the pumps). The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

### Inventory Control and Decay Heat Removal - PA

A fire in this area does not imact auxiliary feedwater.

### Reactor Pressure Control – PA

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by RCS makeup capability as described above.

### Vital Auxiliaries - PA

A fire in this area does not affect any of the credited support system functions. Either train of Emergency Power, Service Water and CCW can be operated from the Control Room.

### Process Monitoring - PA

A fire in this area does not affect any of the credited process monitoring functions. At least one set of Process instrumentation is available at the MCB.

## 8.2.15 YARD – Yard

### Reactivity Control - YARD

Immediate reactor shutdown is achieved by de-energizing all CRDMs which results in control rod negative reactivity insertion into the reactor core.

A fire in this area can impair Charging and Safety Injection due to a loss of "B" 125V DC power or a loss of instrument air to AOV 112B (isolates the RWST from the pumps). The recovery action to locally align and start the Alternate RCS Injection System is used to mitigate this event. The Alt. RCS injection system suction source is a combination of the DI water storage tank TCD05 and the borated water from the Spent Fuel Pool.

### Inventory Control and Decay Heat Removal - YARD

A fire in this area does not imact auxiliary feedwater.

### Reactor Pressure Control – YARD

Initial pressure control is ensured by automatic operation of pressurizer safety valves and by RCS makeup capability as described above.

### Vital Auxiliaries - YARD

A fire in this area does not affect any of the credited support system functions. Either train of Emergency Power, Service Water and CCW can be operated from the Control Room.

### Process Monitoring - YARD

A fire in this area does not affect any of the credited process monitoring functions. At least one set of Process instrumentation is available at the MCB.

## 8.3 Configuration Control

Configuration control of safe shutdown cables and equipment is maintained by procedures which ensure that applicable reviews are completed and applicable analyses are updated. Permanent modifications are controlled by the CC-AA-103, "Configuration Change Control for Permanent Physical Changes" procedure. This procedure includes user references to be used as applicable.

## 8.4 Fire Wrap

Hemyc wrap HWCB03, located in the Battery Room B, is the only Hemyc wrap that is credited for a specific fire rating for hot shutdown under the NFPA 805 license. It is required to protect cables L0318, C0687, and part of cable E0053 against a 25 minute fire (reference 1.2.20).

A tear was identified in HWCB03 under IR 04108798. In accordance with ECP-18-000200-309-101-01, the area near the Hemyc wrap tear reaches a maximum temperature of $101^0$C at 30 minutes. These valves are less than the damage temperature of thermoplastic cables (i.e. 205 $^0$C), and therefore, the tear is considered acceptable without repair.

The Hemyc wrap in containment (Fire area RC), which serves as a radiant energy shield is credited for defense-in-depth for NFPA 805 compliance.

All other Hemyc wrap is being treated as defense-in-depth without a specific fire rating. Tables 8-5a through 8-5d identify locations where fire wrap materials were installed.

# Table 8-4A
# FIRE WRAP IN BATTERY ROOM B

| Wrap EIN | Item Wrapped | |
|---|---|---|
| HWCB01 | E53 - 2-1/2 | cable in 2-1/2" conduit |
| HWCB02 | E20 - 1-1/4 | cable in 1-1/4" conduit |
| HWCB03 | L318<br>C687<br>E53 | cable drop<br>cable drop<br>cable drop |
| HWCB04 | E22 - 1-1/4 | cable in 1-1/4" conduit |
| HWCB05 | E20<br>E22 | cable drop<br>cable drop |

| Cable # | Description of Cable |
|---|---|
| E20 | DC Power to D/G A DC Distribution Panel from Main DC Distribution Panel A |
| E22 | DC Power to MCCH from Main DC Distribution Panel A |
| E53 | DC Power to Auxiliary Building DC Distribution Panel A from Main DC Distribution Panel A |
| C687 | AC Power to MCCH from MCCC |
| L318 | AC Power to BUS14 from D/G A |

Notes:

Fire Area: BR1B

Ref. Dwg: 21488-0201 Sheets 1-3

Ref. ECP-18-000200-309-101-01, Engineering Technical Evaluation – Tear in Hemyc Wrap HWCB03.

# Table 8-4B
# FIRE WRAP IN INTERMEDIATE BUILDING

| Wrap EIN | Item Wrapped | |
|---|---|---|
| HWIB01 | R975-1/2 | cable in 1/2" conduit |
| HWIB02 | R975-1/2 flex | cable in 1/2" flex con- duit |
| HWIB03 | PT478 | pressure transmitter |
| HWIB04 | R1468 | cable drop |
| HWIB05 | R1456-2 | cable in 2" conduit |
| HWIB06 | NM-31 | NIS Source Range Preamplifier |
| HWIB07 | R1456 | cable drop |
| | | |
| **Cable #** | **Description of Cable** | |
| R975 | S/G 1B Pressure Indication | |
| R1468 | N-31 NIS Source Range Neutron Monitor | |
| R1472 | N-31 NIS Source Range Neutron Monitor (contained in R1456-2) | |
| R1475 | N-31 NIS Source Range Neutron Monitor (contained in R1456-2) | |
| R1476 | N-31 NIS Source Range Neutron Monitor (contained in R1456-2) | |
| R1477 | N-31 NIS Source Range Neutron Monitor (contained in R1456-2) | |
| Notes:<br>Fire Area: ABI<br>Ref. Dwg: 21488-0202 Sheets 1-4 | | |

# Table 8-4C
# FIRE WRAP IN CONTAINMENT

| Wrap EIN | Item Wrapped | | Remarks |
|---|---|---|---|
| HWRC01 | R877A-1 | cable in 1" conduit | N/A(1) |
| HWRC02 | R877A-3/4 | cable in 3/4" conduit | N/A(1) |
| HWRC03 | R877A-1/2 flex | cable in 1/2" flex conduit | N/A(1) |
| HWRC04 | PT-420A | pressure transmitter | N/A(1) |
| HWRC05 | R1133-3/4 | cable in 3/4" conduit | N/A(1) |
| HWRC06 | R1133-1/2 flex | cable in 1/2" flex conduit | N/A(1) |
| HWRC07 | LT-433 | level transmitter | N/A(1) |
| HWRC08 | R1467-1 | cable in 1" conduit | N/A(1) |
| HWRC09 | R1467 | cable drop | N/A(1) |

| Cable # | Description of Cable |
|---|---|
| R877A | FI-420A RCS Pressure Indication(contained in R877A-1) |
| R1133 | LT-433 Pressurizer Level Indication (contained in R877A-1) |
| R1467 | N-31 NIS Source Range Neutron Monitor |

Notes:

Fire Area: RC

Ref. Dwg: 21488-0203 Sheets 1-3

1. HEMYC wrap in Containment functions as a radiant energy shield and not as a rated fire barrier. For this reason, supports are not required to be wrapped (or stuffed). The wrap is not rated, and interferences do not require protection.

# Table 8-4D
# FIRE WRAP IN AUXILIARY BUILDING

| Wrap EIN | Item Wrapped | |
|---|---|---|
| HWAB01 | L398 - 2-1/2 | cable in 2-1/2" conduit |
| HWAB02 | C687 - 1-1/2 | cable in 1-1/2" conduit |
| HWAB03 | E53 - 2-1/2 | cable in 2-1/2" conduit |
| HWAB04 | Tray 111 | 24" by 4" cable tray |
| HWAB05 | Tray 111 Supports | Appendix R tray supports |
| HWAB06 | L400 - 1-1/2 | cable in 1-1/2" conduit |
| HWAB07 | E53 | cable drop |
| HWAB08 | E53-2-1/2 | cable in 2-1/2" conduit |
| | | |
| **Cable #** | **Description of Cable** | |
| L398 | Charging Pump A Power | |
| C687 | AC Power to MCCH from MCCC (contained in Tray 111) | |
| E53 | DC Power to Auxiliary Building DC Distribution Panel A from Main DC Distribution Panel A | |
| L318 | AC Power to BUS14 from D/G A (contained in Tray 111) | |
| L400 | Charging Pump A Control | |
| Notes:<br>Fire Area: ABBM<br>Ref. Dwg: 21488-0204 Sheets 1-8 | | |

# 9.0 Communication Requirements

The plant communications system is vital to safe shutdown operations. Equipment operation from outside the Control Room requires coordination and timely operator actions following a fire. This can only be accomplished with a reliable plant communications system. Portable radios are relied upon as the primary means for post-fire communication because of their independence from potential fire damage.

# 10.0 Emergency Lighting

Emergency lighting power units with at least an eight-hour battery power supply in plant areas requiring access following a fire. These include access/egress routes and stations requiring operator actions. Table 10-l identifies the locations of the emergency lights. Diesel-backed security lights located in the yard area and various additional portable hand-held lanterns are available to the operators to supplement the battery-powered wall units.

Emergency Lights are tested under blackout conditions to determine if the emergency lights provide sufficient illumination to support required Operator recovery actions described in Appendix I associated with procedures outlined in section 8.0. The ER-FIRE Equipment lockers have a minimum quantity of (1) flashlight each, which can be used to perform the recovery actions.

Normal and emergency AC lighting is normally de-energized for the test and an evaluation of the illumination levels on Emergency Lighting is performed.

The acceptance criteria for this test is that the Operations representative could read the instructions, follow access and egress routes to the equipment to be manipulated / task to be performed, and evaluate if existing lighting conditions were adequate to complete the task.

Areas Typically Inspected:

- A D/G Room
- B D/G Room
- A Battery Room
- B Battery Room
- Control Room Air Handling Room
- Relay Room
- TSC Building
- Turbine Building
- Service Building
- Screen House
- Intermediate Building North
- Intermediate Building South
- Auxiliary Building

- Standby Auxiliary Feedwater Room

Notes:

- The Main Control Room is normally exempt from this test. Normal AC lights in the Control Room are presently de-energized every 72 weeks during testing of the emergency light DC transfer switch 43/ELDC per RepTask P201210.

# Table 10-1
# EMERGENCY LIGHT LOCATIONS

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| AB-1 | ACCESS & EGRESS | LEFT LAMP - SOUTHEAST TOWARDS STAIRS AND CATWALK<br>RIGHT LAMP - NORTH TOWARDS DOOR F-503 |
| AB-2 | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH - ILLUMINATE WALK-WAY BY S.F. POOL<br>RIGHT LAMP - SOUTH EAST TOWARDS CCW PUMP AREA |
| AB-3 | ILLUMINATE EQUIP-MENT | LEFT LAMP - BUS 14<br>RIGHT LAMP - BUS 14 DC FUSES<br>REMOTE - ARAIRC14 |
| AB-4 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | LEFT LAMP - MCCC<br>* RIGHT LAMP - WEST TOWARDS STAIRS TO SPENT FUEL POOL<br>REMOTE LAMP – NORTH TOWARDS VALVE 9084 |
| AB-5 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | LEFT LAMP - MCCC<br>* RIGHT LAMP - EAST TOWARDS OVERHEAD DOOR S-28 |
| AB-6 | ILLUMINATE EQUIP-MENT | LEFT LAMP - BUS 14<br>RIGHT LAMP - BUS 14 |
| AB-7 | ACCESS & EGRESS | LEFT LAMP - TOWARDS BUS 14<br>RIGHT LAMP - SOUTH EAST TOWARDS HEAT TRACE RECORDER 14A |
| AB-8 | ACCESS & EGRESS | LEFT LAMP - WEST TOWARDS AOV 6310<br>RIGHT LAMP - DOWN STAIRS |

| | | |
|---|---|---|
| AB-9 | ACCESS & EGRESS | LEFT LAMP - TOWARDS BORIC ACID CONTROLS<br>RIGHT LAMP - EAST - ILLUMINATE WALKWAY |
| AB-10 | ACCESS & EGRESS & ILLUMINATE EQUIP-MENT | LEFT LAMP - TOWARDS PENETRATION SPLICE BOX 63<br>RIGHT LAMP - TOWARDS STAIRS<br>REMOTE - ACPDPAB10, ACPDPAB11, ACPDPAB12 & ACPDPAB13 |
| AB-11 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | LEFT LAMP - EAST - ILLUMINATE WALKWAY<br>* RIGHT LAMP - WEST TOWARDS CRANE BAY AREA<br>REMOTE - BUS 16 FUSE CABINET |
| AB-12 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | *LEFT LAMP - DOWN STAIRS<br>*RIGHT LAMP - UP STAIRS<br>REMOTE - V261 & V262 IN VALVE ALLEY |
| AB-13 | ILLUMINATE EQUIP-MENT | LEFT LAMP - MCCD/12M<br>RIGHT LAMP - BUS 16<br>REMOTE - ARBIRC16 |
| AB-14 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | LEFT LAMP - MOV 856<br>* RIGHT LAMP - UPSTAIRS |
| AB-15 | ACCESS & EGRESS & ILLUMINATE EQUIP-MENT | LEFT LAMP - TOWARDS CHARGING FLOW INDI-CATION F-115 & F-116<br>RIGHT LAMP - UPSTAIRS<br>REMOTE - VALVES 850A & 850B |
| AB-16 | ACCESS & EGRESS | LEFT LAMP - EAST TOWARDS OPERATOR DESK<br>RIGHT LAMP - WEST TOWARDS CRANE BAY AREA |
| AB-17 | ACCESS & EGRESS | LEFT LAMP - GENERAL LIGHTING SI PUMP AREA<br>RIGHT LAMP - GENERAL LIGHTING SI PUMP AREA<br>REMOTE LAMP - AIM AT VALVES 315A AND 315C |
| AB-18 | ACCESS & EGRESS | LEFT LAMP - AIM WEST - ILLUMINATE WALK-WAY<br>RIGHT LAMP - EAST TOWARDS WASTE HOLDUP TANK ROOM |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| AB-19 | ACCESS & EGRESS | LEFT LAMP - EAST TOWARDS CHARGING PUMP ROOM<br>RIGHT LAMP - UPSTAIRS |
| AB-20 | ILLUMINATE EQUIP-MENT | RIGHT LAMP - 1A CHARGING PUMP TRANSFER SWITCH<br>REMOTE (LEFT) - ABELIP<br>REMOTE (RIGHT) - V 7009A & V 7009D |
| AB-22 | ILLUMINATE EQUIP-MENT | TWO REMOTE LAMPS<br>ILLUMINATE V-384C |
| AB-23 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS | LEFT LAMP - VALVE 356<br>RIGHT LAMP - VALVE ALLEY MEZZANINE STAIRS |
| AB-24 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS | RIGHT LAMP: NORTH - ILLUMINATE WALKWAY<br>REMOTE (LOWER): ILLUMINATE 14206S 1A VALVE TO 112C<br>REMOTE (HIGHER): ILLUMINATE VALVE 112C |
| AB-25 | ILLUMINATE EQUIPMENT | RIGHT LAMP – 1B CHARGING PUMP<br>LEFT LAMP – ABELIP<br>REMOTE LAMP – 1A CHARGING PUMP VFD |
| AB-26 | ILLUMINATE EQUIPMENT | RIGHT LAMP – VALVE 9081, 9082 AREA<br>LEFT LAMP – VALVE 9081, 9082 AREA |
| AHR-1 | ACCESS & EGRESS | LEFT LAMP - SOUTH - GENERAL AREA<br>RIGHT LAMP - NORTH TOWARDS DOOR F-24 |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| BR-1 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | * LEFT LAMP - SOUTH TOWARDS CELL # 20<br>RIGHT LAMP - DCPDPCB03A |
| BR-2 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | * LEFT LAMP - NORTH TOWARDS DOOR F-26<br>REMOTE LAMP - DCPDPCB03B<br>REMOTE LAMP - DCPDPCB05B |
| CR-1 | ACCESS & EGRESS | LEFT LAMP - SS OFFICE - GENERAL LIGHTING<br>RIGHT LAMP - SS OFFICE - GENERAL LIGHTING |
| CR-2 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | LEFT LAMP - EMERGENCY LIGHT XFER SWITCH<br>* RIGHT LAMP - NORTH TOWARDS DOOR S-51 |
| CR-3 | ACCESS & EGRESS | LEFT LAMP - NORTHEAST - AISLE BEHIND MCB<br>RIGHT LAMP - NORTHWEST - AISLE BEHIND MCB |
| CR-4 | ACCESS & EGRESS | LEFT LAMP - UP STAIRS<br>RIGHT LAMP - DOWN STAIRS |
| DG-1 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | REMOTE LEFT LAMP - APPENDIX R LOCKER<br>REMOTE RIGHT LAMP - WEST SIDE OF KDG01A<br>REMOTE SINGLE LAMP - VALVE 4667F |
| DG-2 | ILLUMINATE EQUIP-MENT | LEFT LAMP - VALVE 8588A<br>REMOTE LEFT LAMP - KDG01A OVER SPEED RESET LEVER<br>REMOTE RIGHT LAMP - KDG01A SPEED CON-TROL & AIR START |
| DG-3 | ILLUMINATE EQUIP-MENT | LEFT LAMP - VALVE 4668F<br>REMOTE LEFT LAMP - KDG013 OVERSPEED RESET LEVER<br>REMOTE RIGHT LAMP - KDG01B SPEED CON-TROL & AIR START |
| DG-4 | ACCESS & EGRESS & ILLUMINATE EQUIP-MENT | RIGHT LAMP - VALVE 8589A<br>LEFT LAMP - KDG0IB WEST SIDE<br>REMOTE SINGLE LAMP - DOOR F-29 |
| GAB-1 | ACCESS & EGRESS | GINNA ADMINISTRATION BUILDING CENTRAL - WEST TO EAST CORRIDOR LEFT LAMP – WEST FIRE DOOR EXIT<br>RIGHT LAMP – EAST ALONG CORRIDOR |
| GAB-2 | ACCESS & EGRESS | GINNA ADMINISTRATION BUILDING NORTH ENTRANCE TO RECORDS MANAGEMENT DEPARTMENT LEFT LAMP – NORTH HALLWAY DOOR<br>RIGHT LAMP – EAST ALONG CORRIDOR |
| GAB-3 | ACCESS & EGRESS | GINNA ADMINISTRATION BUILDING PROCEDURES AND VENDOR TECHNICAL DOCUMENT AREA OF RECORDS MANAGEMENT DEPARTMENT LEFT LAMP – NORTH ALONG HALLWAY<br>RIGHT LAMP – SOUTH ALONG HALLWAY |
| GAB-4 | ACCESS & EGRESS | GINNA ADMINISTRATION BUILDING LOBBY LEFT LAMP – EAST LOBBY<br>RIGHT LAMP – WEST LOBBY |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| IBN-10 | ACCESS & EGRESS | LEFT LAMP - NORTH - TOWARDS DOOR S-37<br>RIGHT LAMP - NORTH WEST - MDAFWP GEN-ERAL AREA |
| IBN-11 | ILLUMINATE EQUIP-MENT | REMOTE LAMP - TDAFWP DISCHARGE VALVES 4297& 4298<br>REMOTE LAMP - TDAFWP DC LUBE OIL XFER SWITCH<br>REMOTE LAMP - V 5397 |
| IBN-12 | ILLUMINATE EQUIP-MENT | REMOTE LAMP - IBELIP PANEL<br>REMOTE LAMP - TDAFWP DISCHARGE VALVES 4297 & 4298 |
| IBN-13 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | LEFT LAMP - REACTOR TRIP BREAKERS<br>* RIGHT LAMP - SOUTH WEST TOWARDS PENE-TRATION SPLICE BOX 67 |
| IBN-14 | ACCESS & EGRESS | LEFT LAMP - SOUTH WEST TOWARDS APP R PENETRATION SPLICE BOX 61<br>RIGHT LAMP - SOUTH WEST TOWARDS STAIRS & CATWALK AREA |
| IBN-15 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | LEFT LAMP - N-32 PREAMP<br>* RIGHT LAMP - EAST TOWARDS STAIRS<br>REMOTE LAMP - PORTABLE SOURCE RANGE EQUIP BY IBELIP |
| IBN-16 | ILLUMINATE EQUIP-MENT | LEFT LAMP - MSIV 3516<br>RIGHT LAMP - MSIV 3517 |
| IBN-5 | ACCESS & EGRESS | LEFT LAMP - DOWN STAIRS<br>RIGHT LAMP - UP STAIRS |
| IBN-6 | ACCESS & EGRESS | LEFT LAMP - DOWN STAIRS TOWARDS DOOR S-45<br>RIGHT LAMP - UP STAIRS - (ABOVE FLOURES-CENT LIGHT) |
| IBN-7 | ILLUMINATE EQUIP-MENT | LEFT LAMP - LOCKED VALVES 5471 & 5473<br>RIGHT LAMP - ATMOSPHERIC RELIEF VALVE AOV 3411 & TDAFW STEAM SUPPLY VALVE MOV 3505A |
| IBN-8 | ILLUMINATE EQUIP-MENT | LEFT LAMP - ATMOSPHERIC RELIEF VALVE AOV 3410 & TDAFW STEAM SUPPLY VALVE MOV 3504A<br>RIGHT LAMP - LOCKED VALVES 5472 & 5474 |
| IBN-9 | ACCESS & EGRESS | LEFT LAMP - STAIRS<br>RIGHT LAMP - NORTH WEST - TOWARDS PLAT-FORM & MOV 3504A |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| IBS-2 | ACCESS & EGRESS | LEFT LAMP - DOWN STAIRS<br>RIGHT LAMP - DOWN STAIRS & PERSONNEL HATCH AREA |
| IBS-3 | ACCESS & EGRESS | LEFT LAMP - TOWARDS STAIRS<br>RIGHT LAMP - TOWARDS DOOR S-46 |
| IBS-4 | ACCESS & EGRESS | LEFT LAMP - SOUTH - TOWARDS AISLE TO AUX BLDG<br>RIGHT LAMP - STRAIGHT TOWARDS FIRE EXTINGUISHERS |
| IBS-5 | ACCESS & EGRESS | REMOTE LAMP - UP STAIRS TO AUX BLDG<br>REMOTE LAMP - DOWN STAIRS |
| IBS-6 | ACCESS & EGRESS | LEFT LAMP - TOWARDS HYDROGEN RECOM-BINER PANELS<br>RIGHT LAMP - UP STAIRS |
| IBS-7 | ACCESS & EGRESS | LEFT LAMP - TOWARDS UP STAIRS<br>RIGHT LAMP - NORTH - TOWARDS CHEMICAL DRAIN TANK |
| IBS-8 | ACCESS & EGRESS | LEFT LAMP - GENERAL AREA<br>RIGHT LAMP - TOWARDS EXIT TO INTER. BLDG - GENERAL AREA |
| RR-l | ACCESS & EGRESS | LEFT LAMP - SOUTH - TOWARDS CONTAIN-MENT ISOLATION RACK B2<br>RIGHT LAMP - SOUTH TOWARDS CONTAIN-MENT ISOLATION RACK A2 |
| RR-2 | ACCESS & EGRESS & ILLUMINATE EQUIP-MENT | LEFT LAMP - WEST TOWARDS DOOR F-502 TO CONTROL ROOM<br>RIGHT LAMP - WEST TOWARDS MCCK<br>REMOTE SINGLE LAMP - RLTRl & RLTR2 |
| SAF-l | ACCESS & EGRESS | LEFT LAMP TOWARDS 43/PSF01A<br>RIGHT LAMP - SOUTH TOWARDS MOV 9629A |
| SAF-2 | ACCESS & EGRESS | LEFT LAMP - WEST TOWARDS DOOR SD/63<br>RIGHT LAMP - EAST TOWARDS WALKWAY<br>REMOTE LAMP - GENERAL AREA LIGHTING |
| SAF-3 | ACCESS & EGRESS | LEFT LAMP-AIM SOUTH WALKWAY LIGHTING<br>RIGHT LAMP – AIM EAST TOWARDS SD/63 |

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|---|---|---|
| SAF-4 | ACCESS & EGRESS | LEFT LAMP – AIM EAST TOWARDS STAIRWAY AND EXTERIOR DOOR<br>RIGHT LAMP – AIM NORTH TOWARDS WALKWAY<br>REMOTE LAMP – NORTH AND DOWN TO ILLUMNATE WALKWAY |
| SB-l | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH - HALLWAY LIGHTING<br>RIGHT LAMP - AIM NORTH - HALLWAY LIGHT-ING |
| SB-11 | ACCESS & EGRESS | LEFT LAMP - EXIT TO RP AREA<br>RIGHT LAMP - GENERAL AREA LIGHTING |
| SB-l3 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH - HALLWAY LIGHTING<br>RIGHT LAMP - AIM SOUTH - HALLWAY LIGHT-ING |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| SB-14 | ACCESS & EGRESS | LEFT LAMP - AIM EAST - HALLWAY LIGHTING<br>RIGHT LAMP - AIM NORTH WEST - HALLWAY LIGHTING |
| SB-15 | ACCESS & EGRESS<br>3 LIGHT UNIT - 1 LAMP BETWEEN OVERHEAD | LEFT LAMP - AIM NORTH WEST TOWARDS WALK THROUGH DOOR<br>RIGHT LAMP - AIM SOUTH TOWARDS BACK DOOR TO STOCKROOM<br>REMOTE LAMP - AIM NORTH WEST - GENERAL AREA LIGHTING |
| SB-16 | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH - HALLWAY LIGHTING<br>RIGHT LAMP - AIM NORTH - HALLWAY LIGHT-ING |
| SB-17 | ACCESS & EGRESS | LEFT LAMP - UP STAIRS<br>RIGHT LAMP - DOWN STAIRS |
| SB-18 | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH TOWARDS DOOR S-79 - HALLWAY LIGHTING<br>RIGHT LAMP - AIM NORTH - HALLWAY LIGHT-ING |
| SB-19 | ACCESS & EGRESS | LEFT LAMP - AIM TOWARDS B ANION TANK<br>RIGHT LAMP - AIM TOWARDS B CONDENSATE STORAGE TANK |
| SB-2 | ACCESS & EGRESS | LEFT LAMP - AIM WEST - HALLWAY LIGHTING<br>RIGHT LAMP - AIM EAST - HALLWAY LIGHTING |
| SB-20 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | LEFT LAMP - CONDENSATE STORAGE TANK LEVEL INDICATION PI-2808<br>* RIGHT LAMP - AIM SOUTH WEST TOWARDS V-4858 |
| SB-21 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH TOWARDS APPR EBL SB-20<br>RIGHT LAMP - AIM NORTH WEST TOWARDS AOV 4913 |
| SB-22 | ACCESS & EGRESS | LEFT LAMP - AIM EAST TOWARDS DOOR F-5 - HALLWAY LIGHTING<br>RIGHT LAMP - AIM WEST - HALLWAY LIGHTING |
| SB-23 | ACCESS & EGRESS | LEFT LAMP - AIM EAST - HALLWAY LIGHTING<br>RIGHT LAMP - AIM WEST - HALLWAY LIGHTING |
| SB-24 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH - HALLWAY LIGHTING<br>RIGHT LAMP - AIM SOUTH - HALLWAY LIGHT-ING |
| SB-25 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH - HALLWAY LIGHTING<br>RIGHT LAMP - AIM SOUTH - HALLWAY LIGHT-ING |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| SB-26 | ACCESS & EGRESS | LEFT LAMP - AIM AT NORTH EXIT TO ACCESS CONTROL AREA<br>RIGHT LAMP - AIM AT WEST EXIT TO SERVICE BLDG |
| SB-27 | ACCESS & EGRESS | LEFT LAMP - AIM WEST TOWARDS DOOR F-18<br>RIGHT LAMP - AIM EAST TOWARDS FIRE EQUIP-MENT |
| SB-28 | ACCESS & EGRESS | LEFT LAMP - STAIRS<br>RIGHT LAMP - STAIRS - (LOWER SECTION) & VESTIBULE LIGHTING |
| SB-3 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH WEST TOWARDS TELEPHONE OPERATOR AREA<br>RIGHT LAMP - AIM SOUTH - HALLWAY LIGHT-ING |
| SB-31 | ACCESS & EGRESS | LEFT LAMP - DOWN STAIRS<br>RIGHT LAMP - UP STAIRS |
| SB-38 | ACCESS & EGRESS | LEFT LAMP - NORTH TOWARDS DOOR S-25<br>RIGHT LAMP - VESTIBULE LIGHTING |
| SB-4 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH - HALLWAY LIGHTING<br>RIGHT LAMP - AIM SOUTH - HALLWAY LIGHT-ING |
| SB-45 | ACCESS & EGRESS | LEFT LAMP - FIRE EQUIP LOCKER ROOM DOOR & GENERAL AREA<br>RIGHT LAMP - AIM NORTH WEST - GENERAL AREA LIGHTING |
| SB-46 | ILLUMINATE EQUIP-MENT | LEFT LAMP - FIRE EQUIPMENT ROOM LIGHTING<br>RIGHT LAMP - FIRE EQUIPMENT ROOM LIGHT-ING |
| SB-47 | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH TOWARDS ACCESS CONTROL AREA<br>RIGHT LAMP - AIM NORTH TOWARDS EXIT TO SERVICE BLDG |
| SB-7 | ACCESS & EGRESS | LEFT LAMP - TOWARDS NORTH EXIT TO SER-VICE BLDG<br>RIGHT LAMP - TOWARDS SOUTH EXIT TO SER-VICE BLDG |
| SB-8 | ACCESS & EGRESS | LEFT LAMP - EAST TOWARDS DOOR S-65<br>RIGHT LAMP - NORTH TOWARDS PCMs |
| SB-9 | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH - HALLWAY LIGHTING<br>RIGHT LAMP - AIM EAST - ACCESS CONTROL DOORWAY |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| SD-1 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS | LEFT LAMP – D/G & GENERAL AREA<br>RIGHT LAMP – D/G & GENERAL AREA |
| SH-1 | ILLUMINATE EQUIP-MENT | LEFT LAMP - BUS 17 DC FUSE CABINET<br>RIGHT LAMP - BUS 18 DC FUSE CABINET |
| SH-2 | ILLUMINATE EQUIP-MENT | LEFT LAMP - BUS 17 & BUS 18<br>RIGHT LAMP - BUS 17 & BUS 18 |
| SH-3 | ACCESS & EGRESS | LEFT LAMP - AIM EAST TOWARDS BUS 17 / 18 UV CABINETS<br>RIGHT LAMP - AIM SWP - GENERAL AREA |
| SH-4 | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH WEST - TOWARDS MOTOR DRIVEN FIRE PUMP<br>RIGHT LAMP - AIM SOUTH TOWARDS DIESEL FIRE PUMP CONTROL PANEL |
| TB-1 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | LEFT LAMP - SOUTHWEST TOWARDS APPENDIX R LOCKER & CTRL ROOM<br>* RIGHT LAMP - AIM SOUTH WEST TOWARDS STAIRS |
| TB-10 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | LEFT LAMP - DCPDPTB02<br>* RIGHT LAMP - AIM TOWARDS B BATTERY ROOM & STAIRWAY AREA |
| TB-11 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | *LEFT LAMP - AIM NORTH WEST - TOWARDS CONDENSATE XFER PUMP AREA<br>*RIGHT LAMP - AIM WEST - ILLUMINATE AISLE BY GEN BUS DUCT COOLER<br>REMOTE LAMP - AIM AT VALVE V6928 |
| TB-12 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | * LEFT LAMP - AIM NORTH WEST TOWARDS COLUMN E-7<br>RIGHT LAMP - BLOWDOWN ISOLATION VALVES 5729 & 5730 |
| TB-13 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH EAST - TOWARDS COLUMN E-6<br>RIGHT LAMP - AIM WEST - TOWARDS EXIT TO SERVICE BLDG |
| TB-14 | ACCESS & EGRESS | LEFT LAMP - WEST STAIRS<br>RIGHT LAMP - AIM SOUTH - ILLUMINATE WALKWAY |
| TB-16 | ILLUMINATE EQUIP-MENT & ACCESS & EGRESS * | LEFT LAMP - SEVERAL AIR VALVES WEST SIDE OF COLUMN A7 - (BY O.H. DOOR S-10)<br>* RIGHT LAMP - AIM NORTH WEST TOWARDS DOOR TO MFP ROOM |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| TB-17 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH EAST - TOWARDS STAIRS<br>RIGHT LAMP - AIM WEST - TOWARDS O.H. DOOR S-10 - ILLUMINATE WALKWAY |
| TB-18 | ACCESS & EGRESS | LEFT LAMP - AIM EAST - ILLUMINATE WALK-WAY<br>RIGHT LAMP - AIM WEST - ILLUMINATE WALK-WAY |
| TB-19 | ACCESS & EGRESS | LEFT LAMP - STAIRS<br>RIGHT LAMP - STAIRS |
| TB-2 | ILLUMINATE EQUIP-MENT | REMOTE LAMP - AIM AT BUS15/01B - (FOR OPTIMUM LIGHT ON BUS 15)<br>REMOTE LAMP - AIM AT BUS13/08C - (FOR OPTIMUM LIGHT ON BUS 13)<br>REMOTE - BUS 15 DC FUSE CABINET |
| TB-20 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | * LEFT LAMP - AIM NORTH - TOWARDS AISLE TO MCCA<br>RIGHT LAMP - DCPDPTB01B |
| TB-21 | ILLUMINATE EQUIP-MENT | LEFT LAMP - V 7002D<br>RIGHT LAMP - V 7000A (10FT ABOVE FLOOR) |
| TB-22 | ACCESS & EGRESS | LEFT LAMP - AIM EAST - ILLUMINATE WALK-WAY<br>RIGHT LAMP - AIM WEST - ILLUMINATE WALK-WAY |
| TB-3 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | >* RIGHT LAMP - AIM EAST TOWARDS COLUMN D-13 & ASBESTOS DECONSHOWER<br>REMOTE LAMP - BUS 11A/08 & BUS 11B/24 CUBI-CLES<br>REMOTE LAMP - BUS 12A/14 & BUS 12B/19 & BUS 12B/17 CUBICLES |
| TB-4 | ACCESS & EGRESS | LEFT LAMP - AIM WEST - AISLE BETWEEN MSR AND CONDENSER<br>RIGHT LAMP - AIM SOUTH WEST - AISLE BETWEEN MSR AND T.B. EX FANS |
| TB-5 | ACCESS & EGRESS | LEFT LAMP - AIM EAST - ILLUMINATE AISLE<br>RIGHT LAMP - AIM DOWN & SLIGHTLY NORTH - ILLUMINATE AISLE |
| TB-6 | ACCESS & EGRESS | LEFT LAMP - UP STAIRS - (AIM AT AC LIGHT ON WALL FOR OPTIMUM LIGHT)<br>RIGHT LAMP - DOWN STAIRS |

| EIN | FUNCTION | LAMP AIMING |
|---|---|---|
| TB-7 | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH WEST TOWARDS EXIT TO SERVICE BLDG<br>RIGHT LAMP - AIM SOUTH EAST TOWARDS DOOR S-44 TO INTER BLDG |
| TB-8 | ACCESS & EGRESS | LEFT LAMP - AIM WEST OVER COLUMN TO ILLUMINATE WALKWAY<br>RIGHT LAMP - AIM EAST - ILLUMINATE WALK-WAY |
| TB-9 | ACCESS & EGRESS | LEFT LAMP - AIM NORTH - TOWARDS INSULA-TOR LAYDOWN AREA<br>RIGHT LAMP - AIM NORTH & WEST OF COLUMN B-11 |
| TSC-4 | ACCESS &EGRESS | LEFT LAMP – AIM EAST – GENERAL AREA LIGHTING<br>RIGHT LAMP – AIM NORTH – GENERAL AREA LIGHTING |
| TSC-5 | ACCESS & EGRESS (3 LAMPS 1 MOUNTED IN HALLWAY) | LEFT LAMP - AIM NORTH - GENERAL AREA LIGHTING<br>RIGHT LAMP - AIM SOUTH - TOWARDS DOOR F-12<br>REMOTE LAMP - VESTIBULE LIGHTING BY DOORS F-12 & F-11 & S-20 |
| TSC-6 | ACCESS & EGRESS | LEFT LAMP - AIM SOUTH - TOWARDS DOOR F-7<br>RIGHT LAMP - AIM EAST - TOWARDS DOOR F-11 |
| TSC-8 | ILLUMINATE EQUIP-MENT &<br>ACCESS & EGRESS * | LEFT LAMP - ILLUMINATE D/G<br>* RIGHT LAMP – D/G & D/G ROOM - GENERAL AREA |

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